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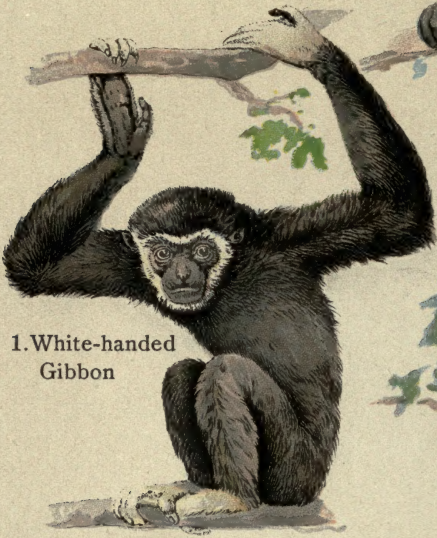
THE HANDY NATURAL HISTORY

Plate I.

2. Orang-Outan



1. White-handed
Gibbon



3. Gorilla



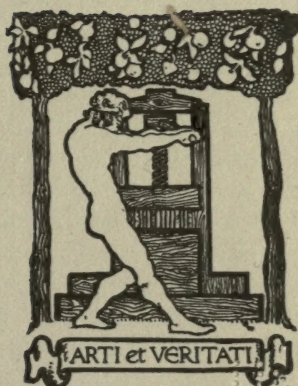
4. Chimpanzee



THE HANDY NATURAL HISTORY

By
ERNEST PROTHEROE, F.Z.S.

With 318 Illustrations
136 being in full color



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TO VANDERBILT
UNIVERSITY

Preface

THE study of Natural History affords many solid advantages and not a few pure delights, since it gives to the heart of man simple and sweet enjoyment while tending to develop some of the noblest sentiments of his being. In the Animal Kingdom the order, the design, the harmony observable in its laws, the marvels of structure and mechanism and the economy observable on every hand, are all proofs of the Divine wisdom and superintendence.

The present work is primarily intended to encourage an intelligent interest in the subject by that large class of readers who have neither the time nor the taste for intricate technical details ; and for this reason an animal is sometimes presented out of the order which a rigid scientific classification would demand. Though it make no pretensions to be a scientific manual, it is hoped it will furnish an interesting and accurate account of the Mammals of the world. Apart from mere information, it will at least lead to a kindly feeling for all that God has created, and assist to a sympathetic understanding of the dumb creatures who minister to our wants and necessities, our comforts, our passions, and our pride.

Some of the older explorers and hunters, whose names occur in the text, encountered various wild beasts in regions from which civilisation has since driven them, and before fire-arms had reached their present-day range and precision ; but reference is also made to great modern Nimrods who have recently hunted big game in every quarter of the

globe. For permission to use various extracts thanks are tendered to Country Life, Ltd. (*Big Game Shooting*); Messrs. Hurst & Blackett (*Lake Ngami or Explorations and Discoveries*); Longmans, Green & Co. (*Eight Years in Ceylon*); Macmillan & Co. (*A Hunter's Wanderings in Africa, Nile Tributaries of Abyssinia, and The Malay Archipelago*); and Mr. John Murray (*Livingstone's Missionary Travels and Researches*). These extracts alone refer to C. J. Andersonn, Sir Samuel Baker, H. A. Bryden, Major C. S. Cumberland, E. D. Cuming, Livingstone, F. C. Selous, and A. R. Wallace.

Other well-known writers, *e.g.*, Rev. J. G. Wood and F. T. Bullen, are quoted in various places, but in the course of much general reading, however, the exact source of a quotation may have escaped notice, and must perforce be covered by a general expression of indebtedness. Great care has been taken to avoid inaccuracies, though it is almost impossible that none should have crept in among the many thousands of facts that go to make up the volume.

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Chapter I

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A BIRD'S-EYE VIEW OF THE WORLD
OF NATURE

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CHAPTER I

Introduction

A BIRD'S-EYE VIEW OF THE WORLD OF NATURE

NATURAL history in its widest sense deals with the entire universe, or everything which God created in the beginning. More often, however, it is applied to a description of the earth and its productions; and not infrequently it is restricted to the animal kingdom alone.

The study of inorganic nature opens up to us a vast realm of bewildering interest. The blue ethereal sky from which by day shine the life-giving sun, and by night the silvery moon, or myriads of twinkling stars! The great globe revolving in illimitable space! The restless, rolling ocean, fed by mighty rivers that rise in stupendous mountains capped by everlasting snow! The sweltering heat of the Tropics, the equable climate of the Temperate zones, the icy breath of the Polar regions! The morning dew, the evening mist, the gentle rain, the feathery snow! The balmy zephyr, the swelling breeze, the howling hurricane! The fiery volcano and the devastating earthquake! The procession of the seasons and the flight of time! All fill us with profound wonder, and provide us with endless scope for reflection upon the might, majesty, and wisdom of Him who orders and controls the mighty forces of nature.

Climate clothes the broad plains, the winding valleys, the swelling uplands, the hill-tops, and even far up the sides of the frowning mountains of the inorganic globe with vegetation, according to the heat and moisture brought to them by the changing seasons. The vegetable life in

the winterless Torrid zone is most luxuriant ; giant trees interlace their crowns, while underneath in the sombre shade is a tangle of undergrowth, through which only axe and billhook can make a path. Nutritious food, too, is to be had for the mere gathering. In the Temperate regions vegetation is less profuse, and summer changes to winter, making it necessary for vegetable food to be cultivated and stored for use when the soil refuses to afford further supplies. In the Frigid zones, Nature's garb becomes increasingly scanty as we approach the Poles ; the stunted trees give place to shrubs ; the verdant green of the grass declines until mosses and lichens are the highest forms of vegetable life ; and all beyond is nothing but everlasting ice and snow.

Vegetation is organic ; it is alive. We can watch a plant spring into life from a tiny seed ; we can see it put forth its tender shoot ; and can study the later development of stem and leaves and flower and fruit. There is nothing in the whole realm of nature more mysterious than this vital principle of life. But though plants have life they are not sentient ; they possess no faculty of sensation and perception ; they can neither see, speak, hear, taste, nor feel—unless we except a few remarkable insect-eating plants. They do not themselves possess the power of movement beyond that which is embodied in the action of growth ; they must perforce remain where they have taken root, even though their situation prove unsuitable to their development or become inimical to their very existence.

On the fifth day of the creation God said, ' Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven.' And the next day ' God made the beast of the earth after his kind, and cattle after their kind, and everything that creepeth upon the earth after his kind : and God saw that it was good.'

The earth thus became peopled with beings, organised and living and sentient. On every side resounded the voices of creatures as varied in size and form as they were complex in nature. To every land region were given the animals best fitted to make their homes there, according

to the surface and the climate. The air was peopled with busy tribes to wander through its boundless space ; the waters teemed with life ; and myriads of insects danced in the sun. There was no spot or object, however insignificant, upon the surface of the earth that was not peopled with tiny denizens to play their part in the great plan of the Creator. Every leaf from a tree is a whole world, and every drop of water a vast ocean to the mites that inhabit them.

But the crowning work of creation was only accomplished in the production of man, the image of the Creator Himself, the last and most excellent of God's mighty works. Of all beings man is the most highly organised ; he possesses the quality of sentience in the most marked degree. To him was given dominion over the whole of the animal world. 'Every moving thing that liveth shall be meat for you ; even as the green herb have I given you all things,' says the Word of God.

If animals were able to express themselves in speech, they could assure us that man compels them to contribute themselves not only to his larder, but to provide material for numerous of his other wants and comforts, to say nothing of ministering to his amusements and even his pride. There is scarcely anything that possesses life which man does not press into his service for food. So far as the reader is concerned it would not be a difficult matter to enumerate the animal flesh of which he partakes from one year's end to another, but that is only because other animal food does not come within his economic range ; and thus the Englishman does not dine off the flesh of the Polar bear for exactly the same reason that the Eskimo abstains from roast beef. The British liking for beef is a national characteristic, but the Hindu reverences the cow and would not defile himself by eating its flesh ; the Siamese abstain from taking the life of any animal, but there is scarcely any creature that creeps or crawls of which they will not partake, if only it has died a natural death. The horse is *par excellence* our beast of burden, but though at one time Christianity rejected horseflesh, it is now the common food of some continental nations.

The lion, tiger, jaguar, and even the evil-smelling skunk, are eaten by man in the regions inhabited by these animals. The dog does not approve of the rank and offensive flesh of the hyæna ; but low type Arabs are less particular. We esteem the dog, the friend of man, for what may aptly be termed his personal qualities ; but John Chinaman has encouraged the animal to adopt a vegetable diet the better to fatten him up for use as domestic meat ; and black cat on a Chinese menu is always an expensive item.

That the flesh of all birds is more or less palatable is more easily understood. In the South of Europe thrushes, larks, and even redbreasts are sent to market in immense quantities ; in Madeira 'fried canaries' are a common dish. For sentimental reasons we should object to dine on these 'sweet birds that breathe the spirit of song, and surround heaven's gate in melodious throng.' For other reasons we should decline the flesh of a vulture that had picked up its living around the Towers of Silence, outside Bombay, where the Parsees expose their dead for food for these most repulsive specimens of the feathered world. Of all our animal foods we pay special attention to the freshness of fish ; but the Gold Coast negro prefers his shark-flesh when it is well advanced towards putrefaction. Even reptiles and insects minister to man's appetite. They may be hideous in shape and movement, loathsome and venomous to touch, but man will not forgo his claims to utilise them. Crocodiles and snakes, frogs and worms, and even centipedes form the basis of meals in different regions. These are but a few examples to show how man exercises his dominion over the animal world in the satisfaction of his omni-carnivorous appetite.

In addition to flesh and milk (butter and cheese), the inferior creation supplies man with skins, fur, wool, hair, bristles, horns, bone, ivory, oils, &c., out of which he fashions innumerable articles to satisfy his desire for warmth and rest and other aids to the comforts of life.

Birds yield eggs for food and feathers for warmth and adornment. Fishes are chiefly valuable as a food product, but they also yield oil ; and in the case of some of the larger

species, fish skin can be transformed into very serviceable leather. The utility of any beast, bird, or fish is not always obvious ; in one part of the world it may be of vital importance to mankind, in another its value may lie altogether in a different direction. The harvest of the North Sea—the cod, plaice, herring, &c.—is destined chiefly for the markets of our great industrial centres ; but on the west coast of Ireland, where the population is sparse, the farmer catches fish, which he spreads upon his fields to rot and thus nourish his land with cheap manure.

When a traveller is about to venture into a far-off and unknown country, he first studies all the available maps and charts constructed by those who have gone before him. We are about to penetrate into a large portion of the animal world on a voyage of inquiry into at least some of the phenomena of animal life, and it behoves us to set about our task upon some recognised method most likely to assist our progress. We shall find that the great naturalists of past ages devised a scheme of animal classification which, with ever increasing knowledge, has developed into roads, smoothed of almost all difficulties for the student who is prepared to exert only ordinary care to keep on the right path. Everywhere are erected finger-posts to direct us to that knowledge of which we are in search—knowledge that will instruct and amuse, that will cause us to take additional interest in the animals that serve us—knowledge that will fill us with admiration for the wisdom of God, and that cannot but call for our tribute of adoration to Him who ‘hath done all things well.’

It is calculated that over two million species of living creatures exist in this world of ours. Between the elephant and the whale, the giants of the animal creation, and the cheese mite, only just discernible with the human eye, there are myriads of creatures differing in size, form, and habit ; and the mite is by no means the most minute of beings. Yet, however large or however tiny it may be, the existence of each living creature is part of God’s beneficent plan ; great and small alike are set to run their course by Him who seeth all and maketh all.

Often when we are meeting with no success in our

search for some lost article we declare that our task is like looking for a needle in a haystack. In dealing with the multitudinous animal forms, if left entirely to our own devices, we should speedily be in a state of absolute bewilderment. The number alone would fill us with doubts concerning our ability to count them; and their astounding variety would convince us of the impossibility of sorting them out so as to obtain even an elementary grasp of our subject. Fortunately, the pleasant paths constructed for us by the naturalists are open to all. If we keep a sharp look-out for the finger-posts and the milestones we shall have a pleasant journey, and arrive at our destination with a load of valuable information, which it has been a pleasure to gather, and which it will be a happiness to store up in our minds.

For a brief space we will survey the great globe upon which we have our being. It consists of quite fifty million square miles of land and nearly three times that expanse of water. Yet by a knowledge of geography we can fix the position of a tiny village, even though it be in some almost inaccessible spot in the heart of a savage country. The navigator, by the use of his charts and the compass and sextant, can determine the position of his vessel, when sailing the trackless ocean, with greater ease than a Londoner can sometimes find his way in the maze of streets in his own city.

In the world at large are two great divisions, the Eastern and the Western Hemispheres. In one of these are four continents, and in the other only one. Continents are divided into countries, which are again divided into states and provinces, and in the case of our own land into still smaller portions called counties. Counties in their turn are made up of parishes, villages, and towns.

Before setting out upon our journey into the ways and byways of the animal world we must take a bird's-eye view of it, the better to observe our bearings. If we exercise a little care we shall be able to note its divisions and subdivisions—the classes, orders, sub-orders, sections, groups, and families—a knowledge of which will afford us invaluable assistance on our way.

All animal life falls into two great divisions : the Vertebrate and the Invertebrate.

The Vertebrate Animals (*Animalia Vertebrata*) form the first sub-kingdom of the animal world. They are easily distinguished by the possession of an internal skeleton, or bony framework. Their body consists of a head, trunk, and limbs. The head is composed of the skull, which incloses and protects the brain ; and the face, in which are the organs of taste, smell, sight, and hearing. The head rests upon, or is attached to, the vertebral column, which is built of a number of separate bony rings, movable one upon another, and forming a canal for the spinal cord, which is the great nerve centre of the body. A man has twenty-six separate bones in his vertebral column, while a python has no less than four hundred. The limbs, which never exceed four, are in pairs. The blood of the vertebrates is warm and red ; all, with the exception of fishes, breathe air through lungs ; and all of them possess a heart.

The Invertebrate Animals include all beings of lower organisation. They possess neither cranium nor brain, no internal skeleton, and no spinal cord. With the exception of the earthworm their blood is colourless and cold. Not a single invertebrate uses the mouth in respiration ; they breathe through holes or slits in the neck, sides, and even the tail. The jaws move horizontally instead of vertically. No vertebrate has more than four true limbs, but invertebrates seldom possess so few. All insects have six ; the spider, which is not an insect, has eight ; crabs and lobsters have ten. Many insects are fitted with wings in addition. Scientific men do not always agree exactly how to classify some of the Invertebrates, if only because they include the insects, which in variety of structure and appearance, and still more so in the numbers of their individuals, far surpass all the larger branches of the animal world.

All animal life can be arranged in two great groups : the warm-blooded and the cold-blooded. Man, the four-footed beasts, and birds fall into the first group ; snakes, frogs, fishes, &c., are contained in the second. It is customary, however, to divide the Vertebrates as set out overleaf.

VERTEBRATE ANIMALS

The Vertebrate animals are usually arranged in five classes :—

I. Mammalia (Latin *mamma*, a teat). Animals which suckle their young, bringing them into the world alive. Examples : Man, monkey, ox, elephant, and whale.

II. Aves (Latin, *avis*, a bird). Birds are oviparous ; they are produced from eggs by the application of heat, usually supplied by the body of the mother bird in close contact with them. The covering of mammals varies very considerably, but birds are always clothed with feathers, which are a part of their special construction for flight. Examples : Eagle, swan, ostrich, and lark.

III. Reptilia (Latin, *repto*, 'I creep'). Reptiles are cold-blooded animals, protected by scales and not infrequently by hard bony plates. They are mostly oviparous, but developed from the eggs more or less casually by the heat of the sun. They can endure long periods of abstinence, and are so tenacious of life that many of them will survive the severest bodily injuries. 'Reptile' is not an apt name, for there are many members of the class that do not creep. Examples : Crocodile, lizard, tortoise, and snake.

IV. Batrachia (Greek, *batrochos*, a frog), or Amphibia (Greek, *amphibios*, having a double life). In this class were once included the reptiles and certain fishes, and the latter term is still popularly used to denote animals that can exist for a considerable time on dry land or in water. They are oviparous, hatched by the heat of the sun from eggs, covered with a soft glutinous membrane, which the mother has laid in the water. In the early period of their existence they are fishlike in their structure, breathing by means of gills and a two-chambered heart ; in the later stages of their development they acquire lungs and a heart of three chambers. A true amphibian possesses at once both lungs and gills. Examples : Frog, toad, and newt.

V. Pisces (Latin, *piscis*, a fish). Fishes are oviparous. Their bodies are covered with scales, which form an important part of their special organisation for life in the

water. They possess a branchial respiration in which their gills, acting as lungs, are enabled to extract air from the water instead of from the atmosphere.

For the present we are only concerned with the first of the foregoing classes. In the Mammalia are all the animals whose organisation is most developed, whose senses are the most delicate, whose intelligence is the most perfect, and which are most closely allied to mankind. They claim more of our attention, not only because they include man himself, but also the whole of the animal creation that is more essential to his immediate welfare. Let us for a moment try to imagine what our life would be if all the members of the class Mammalia were rigidly excluded. Wool, hair, and fur would form no part of our clothing; our animal food would be restricted to the flesh of birds and fishes; we should need a substitute for leather or give up wearing boots and shoes; we should dispense with all articles that are made of bone; and we should banish our friend the dog and cease to make use of any beast of burden.

Having decided which is the particular realm of the animal kingdom we desire to explore, we again consult our charts to ascertain what are the furthestmost limits within which our exploration will be confined.

In dealing with the class Mammalia (and it is the same in the other classes), we find that it contains groups of animals in possession of some similarities in form and structure, and conversely exhibiting common dissimilarities from other groups. The mind almost involuntarily draws together to form a section all those animals which have a mutual resemblance to each other in some certain prominent characteristics.

Each order consists of an associated group, the units in which have certain essential points in common. Nevertheless, in each order there occur numerous distinct, perhaps almost trifling, points of difference which enable us to separate the members of the order into sub-orders, with a further division into sections and groups, and finally into families, each possessing their own distinctive characteristics.

TABLE OF THE ORDERS OF THE CLASS MAMMALIA

I.—**Primates** (Latin, *primus*, first).

SUB-ORDER 1.

Bimana (Latin, *bis*, twice ; *manus*, a hand), two-handed animals. Example : Man.

SUB-ORDER 2.

Quadrumana (Latin, *quatuor*, four ; *manus*, a hand), four-handed animals. Example : the Monkey.

II.—**Chiroptera** (Greek, *cheir*, a hand ; *pteron*, a wing), hand-winged animals. Example : the Bat.

III.—**Insectivora** (Latin, *insecta*, insects ; *voro*, 'I devour'), insect-eaters. Examples : the Hedgehog and Mole.

IV.—**Carnivora** (Latin, *caro*, *carnis*, flesh), flesh-eaters. Examples : Lion, Tiger, Fox, and Weasel.

V.—**Rodentia** (Latin, *rodere*, to gnaw), gnawing animals. Examples : Rat, Rabbit, and Beaver.

VI.—**Ungulata** (Latin, *ungula*, nail, claw, or hoof), hoofed animals.

SUB-ORDER 1.

Hyracoidea (Greek, *hyrax*, shrew-mouse). Example : Syrian Hyrax.

SUB-ORDER 2.

Proboscidea (Latin from the Greek *proboskis*, an elephant's trunk ; literally a front-feeder), proboscis-bearers. Example : Elephant.

SUB-ORDER 3.

Perissodactyla (Greek, *perisos*, superfluous ; *daktulos*, finger or toe), odd-toed animals. Examples : Tapir, Rhinoceros, Horse, Ass, and Zebra.

SUB-ORDER 4.

Artiodactyla (Greek, *artios*, equal ; *daktulos*, finger or toe), equal-toed animals.

Group 1.

Pecora (Latin, plural of *pecus*, cattle) or Ruminantia (Latin, *rumen*, a paunch), ruminating or cud-chewing animals. Examples : Ox, Sheep, Goat, Antelope, Deer, and Giraffe.

Group 2.

Tragulina (Greek, *tragos*, goat), or Deerlets. Example: Kanchil.

Group 3.

Tylopada (Greek, *tylos*, a knob or swelling, and *pous*, *podos*, a foot), Ruminants with digits encased in cutaneous pads. Example: Camel.

Group 4.

Suina (Latin, *sus*, a pig), swine-like animals. Examples: Swine, Peccary, and Hippopotamus.

VII.—Sirenia (Latin, *siren*, a sea nymph), Sea-cows. Examples: Manatee and Dugong.

VIII.—Cetacea (Greek, *ketos*, a whale), animals of the Whale kind. Examples: Whale and Dolphin.

IX.—Edentata (Latin, *edentatus*, toothless), toothless animals. Examples: Sloth, Ant-eater and Armadillo.

X.—Marsupialia (Latin, *marsupium*, a pouch), pouched animals. Examples: Kangaroo and Opossum.

XI.—Monotremata (Greek, *monos*, single; *trema*, a hole), animals whose excretions are discharged by one orifice, as in birds. Example: Duckbill.

It may appear strange that even a recently discovered animal is promptly supplied with a Latin name. It must be remembered that Latin and Greek are the two tongues common to the scientific men of all civilised nations, and whatever may be the common name of an animal in any particular country, its scientific title remains unchanged. In most cases, too, the name is a key to some characteristic possessed by the animal.

Let us for a moment consider a typical instance of the finger-posts and milestones referred to in an earlier page. Take the Brown Bear for example. Its full postal address in Nature is:

Sub-kingdom, *Vertebrata*. Class, *Mammalia*. Order, *Carnivora*. Division, *Plantigrada* (Sole-of-the-foot walkers). Family, *Ursidæ* (Bears). Species, *Ursus arctos*.

The address of the White Bear only differs in the last particular, viz., *Ursus maritimus*. Thus, just as we can fix

the residence of a person by naming the continent, country, county, town, parish, and street, so we can definitely ascribe any particular animal to its exact place in the world of nature.

Although we propose to visit only what we may term the aristocracy of the animal world, we find that it will necessitate our travelling into every corner of the globe. In our own country we leave the city and the mart and all the pageantry of artificial life, and wend our way into the green fields, follow the river's flowery banks, and enter the shade of the tangled wood. We cross the oceans and explore the continents; we traverse vast fertile plains and parched deserts; we plunge into primeval forests; and we climb stupendous mountains. Wherever the human foot and human perseverance can force a way we shall find the animal world at home, to give us varying receptions according to the nature with which the creatures are endowed.

Incidentally in our wanderings we shall learn much that is perhaps outside the immediate scope of natural history, for many animals touch at vital points the lives of the people among whom they dwell. We shall, too, often stray from the beaten tracks of civilisation, and enter into immense solitudes where the explorer and the hunter have only occasionally penetrated. Nevertheless, we shall never be in doubt concerning our course—even there the finger-posts and milestones of the naturalists will unfailingly direct our steps.

If it were not for this assurance as we stand upon the threshold of our task we should be weighed down by the mere contemplation of the immensity and the variety of the mighty creation amid which we live, and of which we, ourselves, were the Creator's supreme effort. But every step in our well-regulated inquiry will but increase our wonder at the vista of extreme interest opened up to us; every new fact which we glean will prove but one more testimony of God's power upon earth, and proof of the riches and treasures of His love and goodness to all mankind.

Chapter II

ORDER I.—PRIMATES

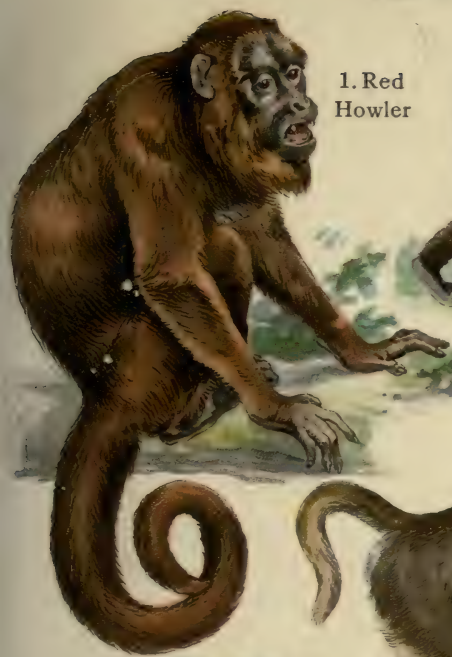
SUB-ORDER I.—BIMANA (MAN)

Man, the most perfect of all created beings
— Man's attitude and strength — Reasoning
faculties atone for natural physical deficiencies
— The bony skeleton — Vertebral column —
Muscles — Brain and nerves — Circulation of
the blood — Digestion — Teeth — Respiration —
The distribution of man — The Caucasian or
White family — The Negro family — The Mon-
golian family — Varieties of the Yellow Race
— Man the dominating force in the world
— Labour's magic wand — The curse mitigated.

Plate II.

LIBRARY OF
CONGRESS

1. Red
Howler



2. Barbary Ape



3. Baboon



4. Siamang



5. Mandrill



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CHAPTER II

Order I.—Primates

Sub-Order I.—BIMANA (MAN)

THIS sub-order consists of only one section, that section of but one group, and that group of but one family—MAN.

‘And God said, Let us make man in our own image, after our own likeness.’ ‘So God created man in His own image, in the image of God created He him ; male and female created He them.’

Of all the wonderful works of God man was the last and the most excellent. In physical attributes alone he is the most perfect of all created beings ; and still more is this the case in the refined, the exalted plan and model upon which he is constructed. In size he is dwarfed by numerous animals ; in strength he is no match for some that do not attain his proportions. He is short-sighted compared to the eagle ; deaf compared to the hare ; and almost without the sense of smell compared to the wild dog or the vulture, who perceives the faintest scent borne to it upon the breeze.

But in man the senses are so nicely balanced and accurately adjusted as to enable him to obtain an intimate acquaintance with the properties of the world around him, in a manner that will contribute to his pleasure, and at the same time ensure his elevation and happiness. The colours of earth and sea and sky gladden his eye ; melody enchants his ear ; the sweet odours of flowers delight his nostrils ; the fruits of summer please his palate ; the glorious sun

and the spangled canopy of heaven entrance him—and all lead him to the contemplation of the Deity, of whose wondrous scheme he is himself the corner-stone.

In addition to all these physical powers he possesses the gift of language, by which to denote his wants and



SKELETON OF MAN, WALKING ATTITUDE.

desires and to express the most abstract ideas of his complex mind. Man alone is a reasoning animal; man alone possesses an immortal soul.

Man's very attitude is indicative of his physical superiority and at once proclaims his dignity, and his separation from all other creatures over whom he was given the dominion.

He sustains himself on his feet, thus giving free play to his hands. The pelvis, the great bones at the bottom of the trunk, rest securely in ball and socket joints upon the stout pillars of the legs, giving enormous strength to the frame when in a vertical position. A practised man can carry upon his shoulders a weight of several hundred pounds, whereas a horse can carry with comfort not more than a hundred pounds; and it is a good camel that can carry a quarter of a ton for any considerable distance. The strength of the horse lies in the direction of its own axis, which is horizontal, and consequently it can draw far more than it can carry. Upon rails one animal has been known to draw a distance of several miles a weight exceeding fifty tons, which would be absolutely immovable against the united strength of several men.

The human hand is situated so as to render it easily available as an instrument of observation. Strong and powerful, it is nevertheless exquisitely susceptible of the most delicate impressions. Every finger, except the ring finger, is capable of independent movement, a power which is possessed by no other animal; the thumb is so elongated that it readily meets the tips of one or all of the fingers, and the fingers themselves, and especially their extremities, possess a discriminating sensibility which is peculiar to man.



THE HUMAN HAND.

That he is naked, and that his physical construction affords him no effective weapons of offence or defence, detract no whit from his superiority over the brute creation, since the very deficiency does but cause him to summon aid from his internal resources, his fertile mind, his reasoning faculties. He clothes himself; he constructs dwellings to protect himself from the weather and to defy the inroads of ferocious animals; his knowledge of the forces of nature enables him to construct weapons that drive to a distance or exterminate the intractable; the more docile he subdues

and forces into his service. Thus art supplies to man what nature has withheld, and with the rude materials to his hand even the uncivilised hunter of the forest holds sway over the animals that make their home in its leafy recesses.

A whole volume could be occupied in but a cursory examination of the structure and composition of the human body, and still more the mechanism of its vital organs. For anything beyond the most brief description the reader must look to works on anatomy and physiology rather than a popular outline of Natural History.

But bones and flesh and blood and nerves and other structures are common to all the mammals. What applies to one is more or less applicable to all; and the constant references to the construction of animals, and especially the points of difference between one species and another, will enable us to proceed on our course with ever-growing, definite knowledge of our subject.

It is the bony skeleton that determines the shape of man or beast and provides a strong, firm and solid support for the softer, fleshy parts. In the case of man there are more than two hundred bones, each distinct in shape and size. Many of them form hinge, ball and socket and pivot joints to allow the human machine smooth and easy movement.

Vertebral Column.—We frequently speak of the backbone, which is misleading in that it is a string of many bones, thirty-three in a child and twenty-six in an adult.



A VERTEBRA.

S.C. Spinal cord.

Each bone is a vertebra; the so-called backbone is the vertebral column. The seven smallest vertebræ form the neck, which supports the head; the twelve succeeding ones support the twelve pairs of ribs. Five bones, increasingly large and solid, form the vertebræ of the loins; the remaining nine bones become welded together as the child advances into adult life: five

of them form one piece, called the sacrum, and the four final bones form a kind of rudimentary tail, called the coccyx.

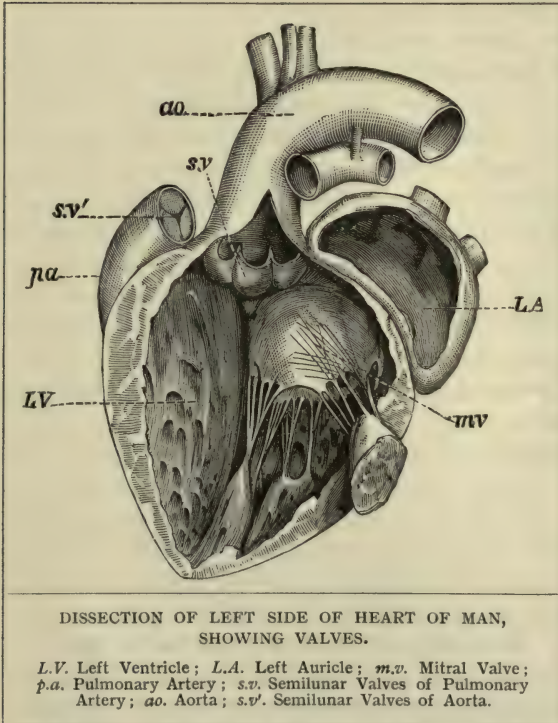
Although every bone in the body serves some special purpose, persons are frequently bereft of limbs by accident, and even some of the bones of the head and trunk, because disease demands their sacrifice. But if their loss inconvenience life it does not destroy it, nor even of necessity shorten it. The removal of the smallest bone of the vertebral column, however, entails certain death, the advance of which all the medical skill in the world is powerless to check.

Muscles.—The bones of the body are clothed with flesh. The red lean flesh is muscle. A mass of red flesh really consists of bundles of tissues capable of moving or sliding about. These movable bundles are the muscles, terminating in tough, leather-like cords, called tendons, which bind the muscle to the bone—an elastic binding which allows at will the freest extension and contraction of the bones thus jointed together. Wherever is required the greatest power of movement, there are the largest and strongest muscles. Compare the mass of flesh around the thigh, the calf, and the arms with the thin covering of the skull; but the bones of the skull do not move and thus have no need of muscle.

Brain and Nerves.—The skull is a hollow, bony box containing the brain, which consists of a white delicate material very different from the solid flesh of the muscles. The cavity of the skull is not only filled up with this substance, but it extends in a narrow, rod-like mass right down the tunnel or canal formed by the hollow ring of each vertebral bone. Running out from the brain into the head and from the spinal cord into the body are delicate white threads that divide into innumerable branches and so spread throughout the flesh. These are the nerves, the telegraph wires of the body. It is the brain and nerves that enable us to see, hear, smell, taste, and touch. Upon the brain depend our will, intellect, and memory, our affections and every emotion of which the human mind is capable. The telegraphic nature of the nerves is easy of illustration. If in the darkness one step upon some slippery substance, in a flash the nerves communicate the presence of danger to the brain; and with equal celerity the brain calls upon the

muscles to flex the bones of the legs into a position best to maintain or regain the equilibrium of the body.

Circulation of the Blood.—We have seen that practically every part of the body is crowded with nerves connected with the brain ; it is equally crowded with blood-vessels connected with the heart. Space will not allow a detailed examination of the composition of blood, but it is easy

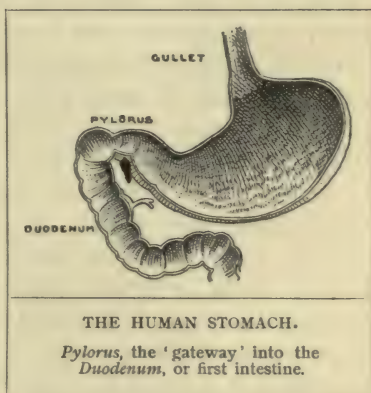


to recognise its importance. Suppose one were to bind an arm very tightly near the shoulder, the result would speedily be discernible. Below the bandage the flesh would grow cold, feeling would be blunted, and movement of the arm would become heavy and

clumsy. If the ligament were sufficiently tight and sustained long enough, the arm would become dead and useless. Why ? Not because we have deprived the arm of its blood, for its vessels might be full to bursting ; but because we have interfered with its circulation. The heart is a pump, which forces the life-giving fluid through its greatest artery, the aorta, which branches out again and again into ever smaller arteries, until the tubes are

as fine as a hair, and in consequence are called capillaries. The blood returns to the heart, not by the way it came, but by wholly different vessels called veins. The blood renews the tissues of the body, which even the simplest acts of our daily life wear and destroy, which is the reason we are tired after great exertion—and the weariness lasts until we have rested and given the blood an opportunity of repairing the damage.

Digestion.—The process of digestion is really blood-making. Food is taken into the mouth, where it undergoes not only the process of mastication, or chewing, but something else of the utmost importance. The saliva, which pours out from the membrane of the mouth, converts the insoluble starch contained in so much of our food into sugar, which is a soluble substance, and is easily absorbed and dissolved in the blood. In the stomach the food is ground and churned up with a fluid called the gastric juice. Unlike the saliva, this fluid will not act upon starches, but it will dissolve lean meat and the glutinous parts of bread and other substances. Fats and the oily parts of our food are unchanged even after their passage through the mouth and stomach. It is not until the partly digested mass reaches a long tube, called the intestine, that the liver supplies another fluid, called the bile, to extract the remaining nourishment. The stomach constantly gives up to the blood-vessels all around the food which it has fully dissolved; and as the remainder passes along the intestinal canal all that is of value is finally absorbed into the blood, leaving the waste, the useless undigested material, to be expelled from the body.



THE HUMAN STOMACH.
*Pylorus, the 'gateway' into the
Duodenum, or first intestine.*

Teeth.—Intimately connected with the process of digestion are the teeth, the arrangement of which is highly im-

portant, as they form a capital standard of comparison among the mammalia generally. The skull incloses and protects the brain ; but it also bears the jaws, without which it would be impossible to swallow the food preparatory to digestion. Each of the jaws is fitted with teeth, which are so arranged that the surfaces of those in the upper jaw correspond with those in the lower. The top or crown of the tooth is capped with enamel, the hardest substance in the body.

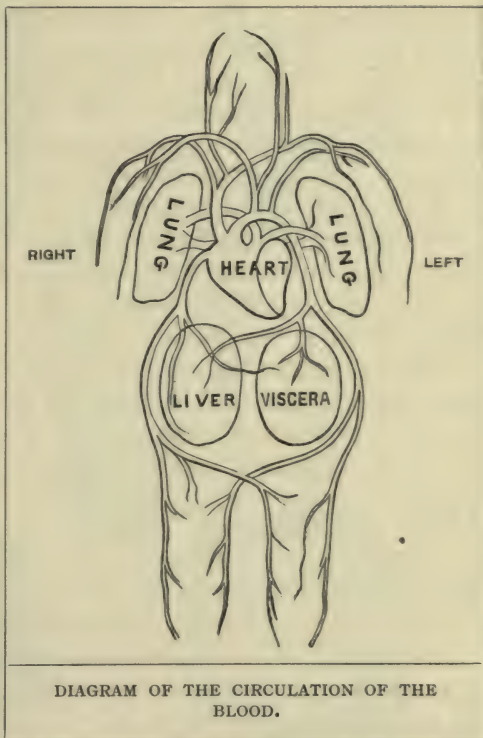
Teeth are of three kinds, viz., the incisors or cutting teeth, canines or dog teeth, and premolars and molars or grinding teeth. During life man has two sets of teeth ; the first, called milk teeth, are twenty in number ; they fall out during childhood, being replaced by the permanent teeth to serve throughout the duration of life. The permanent teeth are larger and stronger than the milk teeth and there are thirty-two of them instead of twenty. An adult man has two incisors, one canine, two premolars and three molars on each side of the jaw, top and bottom.

Respiration.—Terrestrial creatures breathe air ; fishes, too, breathe air, which is dissolved in the water. The arterial blood pumped through the aorta is as pure in quality as it is bright scarlet in colour. In its passage through the body it parts with its life-giving qualities and takes up the impurities given off by the worn-out tissues ; and when it returns by way of the veins it is a dark purple poisonous mixture, not only useless, but a positive danger to the body. It is chiefly loaded with poisonous carbonic acid gas, of which the venous blood must be cleansed before it can again be put into circulation. The heart has four chambers, each guarded by a valve. Pure blood passes out of the left ventricle and venous blood returns into the right auricle. By way of the pulmonary artery the right ventricle sends the impure fluid to the lungs for purification.

By means of the nostrils and the mouth we take in fresh pure air, of which about 22 per cent. is oxygen, which is absolutely necessary to sustain life. At the back of the mouth and the nasal passages is the windpipe, or trachea, which passes into the thorax, or chest, where it

divides into two pipes, each called a bronchus, and each passing into a lung. In the lung the bronchus divides and subdivides into the bronchial tubes, finally becoming very tiny air cells. This accounts for the lungs being soft and spongy and extremely elastic. Actual examination is far better than any mere verbal description, and as what the butcher calls sheep's lights are but the lungs of the animal, one need not go

far for an actual specimen. In passing it may be pointed out that the body of a dead rabbit will provide numerous illustrations concerning bones, joints, muscle, nerves, &c. The incoming breath fills the air cells of the lungs with oxygen, which the venous blood exchanges for its poisonous carbonic acid, which is expelled from the body in the outgoing breath. And then the purified blood is



conveyed by the pulmonary veins into the left auricle of the heart, ready to be sent again circling through the body.

Numerous organs of the body have not even been mentioned, let alone described. This mere rapid survey of but a few of its wonders must suffice to allow us to dwell upon man's place in the general scheme of creation, rather than to examine more closely into his structural and functional excellences.

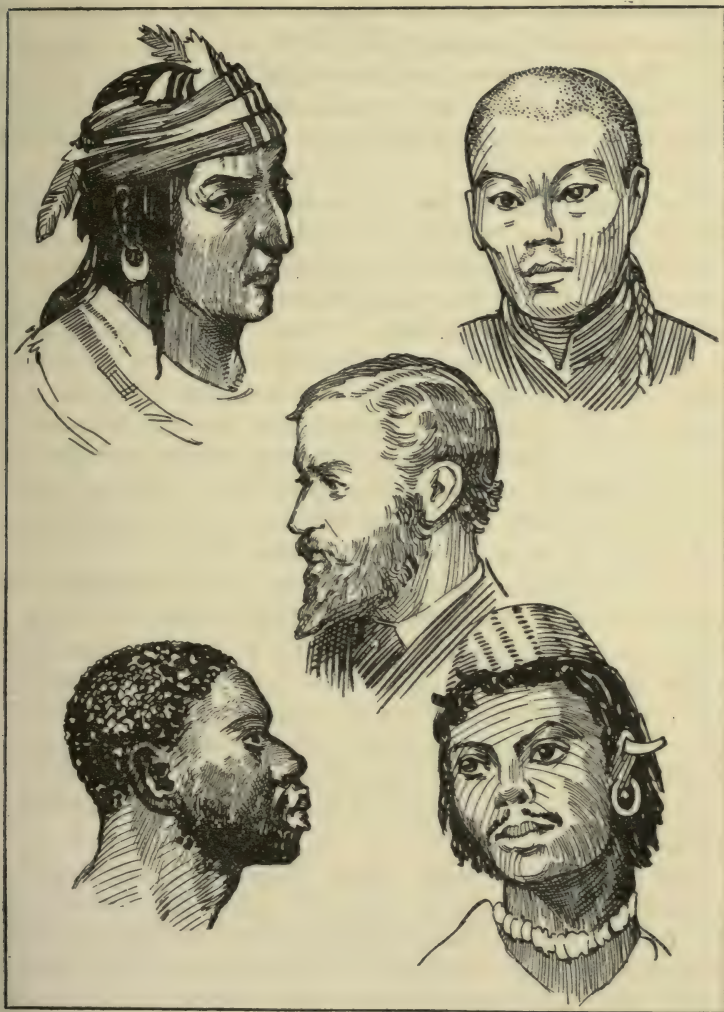
No profitable purpose connected with our immediate task would be served by endeavouring to trace the exact manner in which mankind, descended from a common parent, has spread itself over every portion of the globe and ramified into a thousand tongues and nations. The very distribution of man is but one more convincing proof of his superiority over the beasts of the field. The inferior animals, notwithstanding, in many cases, marked powers of locomotion, are constrained to occupy particular regions owing to their physical structure, their covering, and the limitations of their natural diet. Man is not restricted to any particular environment, since he can clothe himself in accordance with varying temperatures, and he can find food of some kind wherever he may take up his abode. Thus in mountain and valley, forest and desert, anywhere between the burning regions of the Torrid zone, and the ice-girt shores of the Polar seas, we find man modifying his food according to the locality. Upon the heated plains of India he thrives upon rice, the plantain, and the palm; on the frozen snows of Greenland he feasts upon the raw flesh and blubber of the seal—and between these points there are innumerable grades and distinctions in habits, manners, and food, in civilisation and moral qualities.

Notwithstanding the number of tribes into which humanity is divided, presenting distinct differences in stature, tint and feature, the few great races of mankind possess their own special and unmistakable characteristics.

The population of the entire globe is approximately 1,700,000,000 and consists of three main types, the Caucasian, the Negro, and the Mongolian.

The Caucasian, Indo-European, or White family includes nearly the whole of the people of Europe, Arabia, Persia, Afghanistan, and Hindostan; the Jews, wherever they are found; and some of the inhabitants of Northern Africa. The chief characteristics are a white or fair skin, which is naturally swarthy in the warmer regions, a large skull, an expanded forehead, an oval face, and long wavy hair. That the Hindoo should be classed with the Briton may appear strange upon the face of it; but though he varies in colour

from almost pure white to jet black, in all other respects he closely resembles the white man.



RED INDIAN.
NEGRO.

CAUCASIAN.

MONGOLIAN.
MALAY.

The White races, those of Western Europe in particular, have wrought the most marked changes in the distribution

of man. There is no corner of the world that they do not ransack for food and raw materials for their manufactures, or in search of markets for their varied wares ; and north, south, east, and west they have seized and peopled vast regions to which originally the white man was a stranger. Thus there are now 120,000,000 of English-speaking people, two-thirds of whom are thousands of miles away from "that little stone set in the silver sea" which is the real home of the Briton.

The Negro family has its home in Central and South Africa and some portions of Polynesia. A black skin, narrow skull, low forehead, thick lips, and woolly hair are distinctive features that never leave room for doubt concerning the negro's identity. There are millions of him in the West Indies and the United States, but he would never have got there of his own initiative ; he was too apathetic, too ignorant, to provide the means of traversing thousands of miles of ocean. He was conveyed there by the dominating, cosmopolitan white man, that he might till the new lands which the Western nations of Europe had seized to themselves in the New World.

The Mongolian family occupies North, Central, and Eastern Asia. The chief characteristics are a skin of a yellow tinge ; the skull oblong, with a receding forehead ; cheek bones prominent and the nose short and broad ; very closely-set narrow eyes ; and long, straight, black hair. The Chinese, Japanese, and Tartars are the chief members of the family ; but the Eskimos, Lapps, Finns, the Magyars of Hungary, and the Turks are of the same stock.

The *Malays* and many of the *Polynesians* and the *Red Indians* are not separate types ; they are but varieties of the Yellow race. They possess almost exactly the same distinctive features, except that the Malay has a dark brown tawny skin, while the Indian has a coppery complexion that has earned for him the name of red man.

It is man who is the dominant force in the world, for whom the Creator provided the wonders of earth and sea and sky, at whose disposal was placed every good thing which the wisdom of God conceived could minister to

his legitimate desires. In the very beginning man fell from his high estate and the ground was cursed in punishment; but man's labour escaped the Divine wrath and afforded him the means to render the curse less operative.

Since God looked upon the earth and declared that it was good, its physical aspect has undergone enormous changes by the slow and sometimes violent upheavals of volcanic forces and the ceaseless wear and tear of the elements. But these changes bulk small in comparison with the transformation which man, and especially the white man, has achieved by his labour. We have but to contemplate our own land in illustration of the point. It is less than two thousand years ago since Britain first saw the light of civilisation, when Julius Cæsar crossed over from Gaul to add the island to the Roman dominions. The land was covered with almost impenetrable forest, where the ancient Briton built his wattled hut, or dug a less pretentious retreat in the ground, in which to rest his woad-stained skin-clad limbs when wearied from the chase.

And now? Through the centuries 'clamorous Labour has knocked with its hundred hands at the golden gate of the morning'; and the call has been answered with ever-growing energy. Labour has waved its magic wand over the toiling hordes. Forthwith forests have been cleared to give way to tracts smiling with golden harvests; from the depths of the earth have been wrested her precious stores; furnaces blaze, forges glow, anvils ring, and machinery whirs and whirls. From the rude settlements of the barbarian have sprung cities alive with the interests of commerce, science, and art. On road and river, railway and canal, are conveyed to our doors the necessities and the luxuries of life. From the busy quays vessels traffic to and fro over the waste of waters, in search of materials to shape and mould and weave to meet our own needs and for barter in the markets of the world. 'Civilisation smiles; Liberty is glad; Humanity rejoices; Piety exults'—for everywhere in the mighty camps of men, as in the tiniest hamlets nestling under lonely hills, arise the temples of Religion, wherein is worshipped the Father of all.

But though man's labour has mitigated the curse, only

the blood of Christ can wipe out the stain. To-day only about a quarter of the human race even professedly bow the knee to the Captain of our Salvation ; and not until the Gospel is on every tongue, and still more in every heart, will man rise to that high pinnacle above the brute creation whereon in the very beginning God placed him.

Chapter III

ORDER I.—PRIMATES (*continued*)

SUB-ORDER 2.—QUADRUNANA, OR THE
MONKEY TRIBE

The Quadrumana or four-handed animals—
Man and the Monkey from an anatomical
point of view—Monkey Speech—The Origin
of Species—The Anthropoidea—The Catar-
rhine Monkeys: Family Simiidæ: Gorilla
— Chimpanzee — Orang-Outan — Gibbons —
Siamang — Family Cercopithecidæ: Genus
Cercopithecus: Green Monkey — Pig-tailed
Macaque—Barbary Ape—Wanderoo—Yellow
Baboon—Chacma—Thoth—Mandrill—Diana
Monkey—White-nosed Monkey—Mangabey—
Patas or Red Monkey—Genus Semnopithe-
cus: Hanuman Monkey—Proboscis Monkey
— Platyrrhine Monkeys: Spider Monkey —
Coaita — Red Howler — Capuchin Monkey—
Saki—Hand-drinker—Dourocouli — Marmoset
— Lion Tamarin—Lemuroidea: Ruffed Lemur
— Ring-tailed Lemur—Brown Mouse Lemur
— Slender Loris — Slow Loris — Galago —
Tarsier—Aye-Aye—Dermoptera: Colugo.

PLATE I.



1. GALAGO.

(See page 73)

2. YOUNG ORANG-OUTAN.

(See page 49)

PLATE II.



1. PIG-TAILED MACAQUE.
(See page 54)

2. PATAS MONKEY.
(See page 62)

(Photos W. S. Berridge, F.Z.S.)

CHAPTER III

Order I.—Primates (*continued*)

Sub-Order 2.—QUADRUMANA, OR THE MONKEY TRIBE

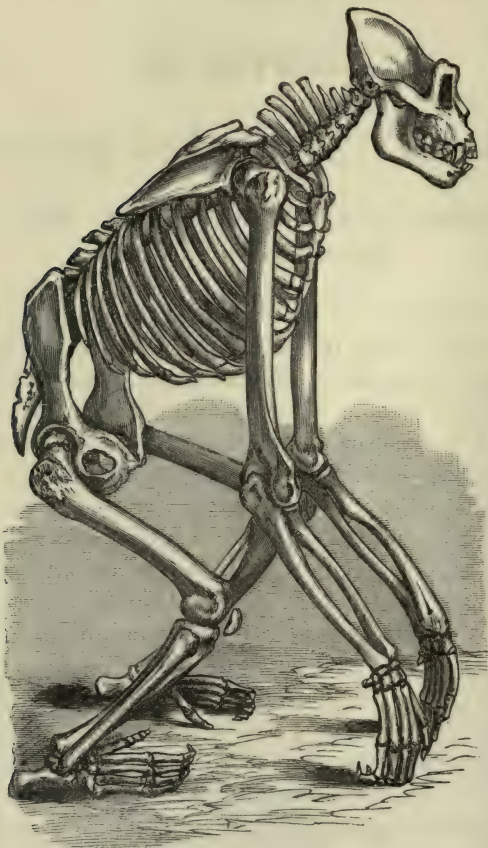
IT is not always an easy matter to allocate an animal to its exact place in the classification of the Mammalia, but there can be no difficulty in distinguishing any member of the monkey tribe. If an examination of the great toe of the hind foot show that it is opposite to the other toes, thus converting it into a hand, it is proof positive that the animal is a monkey of some kind. With the exception of a few species the fore limbs also possess an opposable thumb. It is this peculiarity that earns for the animals the scientific name QUADRUMANA, *i.e.*, four-handed.

Because the monkey of all living creatures is the most like man it is placed in the front rank of the animal creation. A glance at Coloured Plate I. shows that the resemblance is more apparent than real; the highest of the monkey tribe are but the most grotesque caricatures of humanity.

But if we examine the monkey from an anatomical point of view we find that it very closely resembles man in many important particulars. In a previous chapter we noted the distinguishing characteristics of the human skeleton, with which it is interesting to compare the frame of the gorilla in a walking attitude. Very often such comparison is misleading, since the ape is depicted in an upright attitude, a position that it adopts only with difficulty.

Ignoring the tail, the animal possesses only a few more bones than a man. The teeth, though usually the same in

number as in mankind, are less regular. There is a marked difference in the relative length of the limb bones, but upon the whole the proportions of its parts are very much the same as in the human being. Nevertheless, there are anatomical differences so marked as to form an absolute



SKELETON OF GORILLA, WALKING ATTITUDE.

gulf between even the lowest and most degraded of the human race and the highest of the manlike apes.

How dissimilar are the hands of man from his feet ! The latter are to stand upon and not to take hold of objects with. It is worthy of notice, however, that the human foot under the pressure of necessity makes a very serviceable

hand. The foot of a baby is remarkably prehensile, and would become increasingly so but for the wearing of shoes, and the foot of the savage is always more mobile than that of the civilised man. In some cases where a person has been born without, or by accident deprived of, his arms, the feet have been made use of with wonderful ability. Instances are on record where armless men have with their feet wielded pencil or brush with such skill as to carry off no inconsiderable prizes in the world of art.



THE HUMAN FOOT.

The hind extremities of the monkey are indeed hands that serve it well in its arboreal existence, but as feet they only permit it to adopt an erect position with awkwardness, if not discomfort. They are so formed that the animal cannot stand squarely upon the soles ; the weight is thrown upon the sides of the feet and the knees are always partially bent.

The most manlike apes frequently walk short distances in an upright posture, but their progression is always ungainly, and necessitates the use of outstretched arms with which to balance themselves. There is little doubt that the most highly trained monkey in captivity adopts the biped method of locomotion with certainly not more success than a dog. Numerous mammals, notably the bear, frequently rear themselves upon their hind feet in search of food or to take a more extended view of their surroundings ; but if alarmed they immediately drop on all fours in order to attain the speed necessary to escape the threatened danger. In this respect the monkey is no whit better than any of the less pretentious quadrupeds.

The fore extremities lack the salient qualities of the human hand quite as much as the hind ones fall short of those of the human foot. There are several families of monkeys in which the thumb is practically non-existent ; but the freest and most opposable monkey thumb cannot make the animal's hand anything but a mockery of its

human prototype. Even if the most generous consideration be extended to the monkey, it cannot be admitted that it possesses a true hand—it is nothing better than a mischievous, artful, thieving *paw*. The human hand is not only a marvel of mechanism, but it possesses an intellectual power, an individuality, in close association with the active brain and the glorious soul of its human owner.

Old-time travellers brought home wonderful accounts of 'men with long tails and covered with yellowish hair navigating the ocean in boats and bartering parrots in exchange for iron.' Such stories nowadays would not obtain credence outside a nursery.



FOOT AND HAND OF A MONKEY.

It was an idea, not always restricted to savages, that monkeys are capable of speech, but refrain from its expression lest they should be compelled to labour. Professor Garner in recent years has attempted

to learn the speech of monkeys. Inclosing himself in a cage in the heart of an African forest, by means of the phonograph he took careful records of the sounds emitted by the animals around him. In common with almost all animals, monkeys give vent to varying cries to express pleasure, pain, and other emotions; but the reduction of monkey sounds into any orderly system of recognisable speech must be written down as a complete failure.

Linnæus imagined that it was possible to find a *homo troglodytes* (literally 'a man dweller in the caves') only a

little lower than himself and capable of progressive improvement. Possibly this was an incipient notion of the theory with which Charles Darwin, a famous naturalist, disturbed the scientific world half a century ago. In a noted book, *The Origin of Species*, he attempted to explain how all existing species may have descended from one or at least very few low forms of life. Heated controversies were excited which have not yet been laid to rest, resulting in considerable changes in classification in zoology and biology.

Any discussion of the vexed question of evolution would be out of place in the present work, but one or two interesting points may be noted. It is not claimed, as is often popularly supposed, that man is descended from the monkey. A man would not say that he is descended from his cousins, since both he and his cousins are the descendants of their ancestors.

When, in teaching it to walk, a child is first held to the ground, only the outer portions of its feet rest upon the surface. The soles are rather opposed to each other; in fact, the child adopts the bough-grasping attitude. The forehands of many monkeys are merely grasping hooks in which the thumb, or the apology for it, is not called into play. Young children show a habitual disuse of the thumb, and whether employed or not the hand is usually held in a grasping position. It is a remarkable fact that an infant under an hour old will support its own weight by its hands for at least thirty seconds, and a child of three weeks old has supported itself for quite two and a half minutes.

Civilised beings may not be flattered at the suggestion that they originally sprang from the same stock as the monkey, but there are types of the human family who, in their personal characteristics, apart from their physical structure, are but little removed from the four-handed beast. In any case it is impossible to establish any regular ascending series from the lower monkeys to man, the highest animal type. The Orang appears to come very close to man in that it possesses even a beard, but its chin is less like man than is the Siamang's. The Orang's backbone in

its lower region is formed closely after the human pattern, but its teeth are less human than are those of the tarsier of Celebes, while its nose and brain are less perfect than those of the gibbons.

Monkeys are too numerous in species for anything approaching complete enumeration. In the accompanying plates are figured representatives of many of the principal families, and our remarks will be largely confined to those thus presented to the eye. The reader will be better enabled to discriminate between man, made in the likeness of his Maker, a moral agent and a reasoning soul, and the most highly developed ape, whose intelligence ranks below that of the faithful dog. We shall give not a mere description of the various members of the monkey tribe, but also remark upon their instincts, their varied dispositions and different degrees of intelligence, together with some consideration of their economic value to mankind.

This plan will be adopted throughout our review of the Mammalia, so as to bring vividly before the eye and the mind that there is nothing more wonderful in all the world than an organised body possessed of life, motion, sensation, and thought. We shall find that the divine Artist with unerring precision has endowed each animal with just the qualities best fitted to its needs. It is not only the heavens that 'declare the glory of God,' not only the firmament that 'sheweth His handywork.' Throughout the phenomena of animal life from man downwards to the meanest reptile or insect that creeps upon the earth, God's infinite wisdom is unfailingly displayed.

SECTION I.—ANTHROPOIDEA.

In this section are all the animals which resemble man (Greek, *anthrōpos*, man). Strictly the term monkey, as used by the specialists, includes only one group of the great Simian family; but the popular use includes apes, baboons, and lemurs, notwithstanding the fact that the last named, as well as the marmosets, are provided with claws instead of flat nails.

In Group I., the CATARRHINI, are all the apes and monkeys of the Old World. The group possesses certain characteristics that cannot be mistaken. In a few cases the thumb of the fore limbs is absent, but whenever it is present it is opposable; the nostrils are placed close to each other, and the tail, if the animal possess one, is never prehensile.

FAMILY SIMIIDÆ.

The family Simiidæ (Latin, *simia*, 'an ape,' from Greek *simos*, 'flat-nosed, snub-nosed'), or Anthropoid apes, more closely resemble man than any other branches of the Quadrumana. In the family are only the gorilla, the chimpanzee, the orang-outan and the gibbons. All four are arboreal in habit, and consequently the old name *troglydites* (cave-dwellers) was never really applicable to them.



A CATARRHINE MONKEY.

GORILLA (*Gorilla savagei*).

Coloured Plate I. Fig. 3.

The Gorilla, the largest and strongest of the Anthropoid apes, has its home only in the hottest parts of West Africa, particularly in the damp, shady forests between the Congo and the Niger. In all probability the whole area of its habitat does not exceed a thousand square miles. The

animal was so named by Hanno, a Carthaginian explorer, who visited tropical West Africa about 350 B.C. Upon his return home he brought with him three stuffed specimens. It is, however, extremely doubtful whether the explorer penetrated sufficiently far southwards to come in contact with the Gorilla; it is far more likely that his captures were only large baboons.

The animal was not really known to Europeans until 1847, when Professor Richard Owen procured a skull from Dr. Savage, an American missionary on the Gabun river. In 1852 large numbers of the apes migrated to the coast, probably owing to some unusual, and never repeated, failure in their food supply, and several were killed and despatched to Europe and America. The next year, at the Royal Institution, Professor Owen rather startled his audience by the information he afforded concerning the manners and personal peculiarities of the Gorilla, which promptly caused the animal to be placed in a new genus, based chiefly upon the marked difference in the sizes of the male and female, the protruding canine teeth, and the prominent cranial ridges above the eyes.

In 1861 Du Chaillu, the French traveller, described the Gorilla in fuller detail; and though at the time his account was considered to be largely romance, later knowledge has in the main only proved his correctness. The male not infrequently exceeds six feet in height, and averages five and a half feet, which is beyond the mean height of man; the female is smaller.

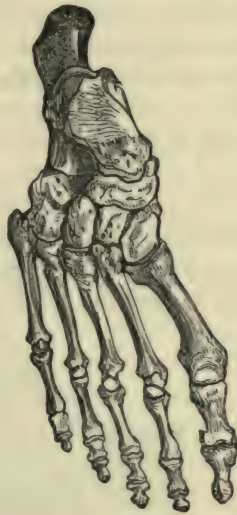
A full grown Gorilla is a formidable creature. A glance at the skeleton will show the capabilities of special muscular power in the limbs and jaws. The shoulders are extraordinarily massive, to which is joined the bullet head by scarcely a vestige of neck. The great brawny arms extend nearly to the knee when the animal is upright; the hands are very broad; the fingers are short and thick, and are united by webs almost to the first joint. The middle finger is often quite six inches in circumference. The foot with its great toe, set out at an angle of about 60 degrees, is not unlike a giant hand of immense power and grasp. It is turned in but little, and is better fitted for walking on the

ground than is the case with the majority of quadrumanous animals.

The skin is an intense black and covered for the most part with short, coarse, dark grey hair, which is whitish at the tips. That on the face and head is reddish-brown in colour, and there is a distinct beard, or rather a ruff, under the chin. In old age all Gorillas are grizzled. The skin of the face is black even to the lips and is hideously wrinkled. The ears are comparatively small. The eyes, grey and deeply sunken, sparkle malignantly below an overhanging



ANKLE AND FOOT BONES
OF GORILLA.



ANKLE AND FOOT BONES
OF MAN.

bony frontal ridge that gives to the features a fixed scowling expression. The mouth is wide, and the slight lips, drawn up, reveal the powerful jaws, from which the huge canine tusk-like teeth project, to give to the general appearance a final touch of ferocity. The canine teeth are separated from the incisors in the upper jaw by a space.

Notwithstanding their great size, Gorillas spend most of their time in trees, about which they spring and leap with unexpected agility. On the ground they usually walk on all fours, always doubling up the fingers of the hands and

resting their weight upon the knuckles. They wander about in family parties, which generally consist of the two parents and their offspring of varying ages. They do not move about at night. It is said that the female plait the branches of a tree-top into a platform, upon which are placed sticks and leaves and moss, where the mother and her young can sleep in comfort. The male sleeps at the foot of the tree, ready to guard his family from the attacks of leopards, which are the only animals the great ape really need fear in his forest home.

The Gorilla is a fairly strict vegetarian, restricting itself chiefly to tender palm shoots, paw-paws, bananas, various plum-like fruits and nuts ; to crack hard shells a stone is requisitioned. Upon occasion it does not disdain honey, insects, and birds' eggs. Though some travellers assert that it eats flesh, there is no proof that it ever kills other animals in order to obtain it.

The great uncertainty that long existed concerning the Gorilla was chiefly due to its shyness ; it is but rarely seen even by the stealthy natives. When surprised it screams with fright and attempts to make its escape. Should it be



SKULL OF THE GORILLA.

wounded or hampered in its flight it instantly shows fight. Balancing itself by swinging its arms, the barking voice changes into a terrific roar from the deep cavernous breast as it waddles to meet the foe face to face. It uses its gigantic arms as weapons of offence, and one blow of the huge paw will break the breast-bone or crush the skull, or lay bare the entrails of the

poor hunter. At close quarters it will adopt the tactics of the bear, hugging its foe as it tears with its great teeth. Should the hunter miss fire, it is said the animal will rush in and snap the barrel in two between its powerful

jaws, which probably may only be true of the cheap weapons which are specially manufactured for supply to the natives. It is a difficult matter to afford actual evidence of men being killed by this gigantic ape; but the fact that with its powerful hands and teeth it is a match for the leopard in open combat is quite sufficient proof of its courage and fighting capabilities.

It is very certain that the Gorilla is held in wholesome dread by the negro inhabitants. They tell fabulous tales of it carrying away men and women into the forests; and that from the trees it will hang down to seize and strangle passing travellers. When the Gorilla dies its friends bury it under a heap of loose leaves; and should Gorillas kill a negro they will give him the same rude burial.

Our knowledge of the animal is still limited; a live one was not brought to Europe until 1876. It is impossible to tame an adult, and the few young ones that have been brought to various zoological collections have always fallen victims to lung disease within eighteen months.

Probably even additional familiarity with the habits of the Gorilla will not cause him to rise greatly in our estimation. Even the natives call him 'The Stupid Old Man.' He is particularly fond of sugar-canes, and occasionally raids the plantations in the settled districts. He attempts to take in his arms both cut and uncut canes, and when the strongly rooted dainty defeats his purpose he is unable to account for it, flies into a rage, and goes away empty-handed. He lives in a rainy region, and though he practically builds a house, he has not the wit to add a roof. If the animal should happen upon a fire which the natives have left he will enjoy the warmth of it as long as there is a spark left, but he lacks the sense to feed the fire, though boundless fuel surrounds him. Man-like the Gorilla may be in some structural respects, but in intelligence he is the veriest brute. From time immemorial the animals have lived in communities something like men, but during countless ages they have learnt nothing; they remain as brutish as ever were their ancestors.

CHIMPANZEE (*Anthropopithecus troglodytes*).

Coloured Plate I. Fig. 4.

This animal has been known to Europeans for hundreds of years, probably through the medium of negroes and wandering Arabs, who often capture the young apes to keep as tame pets. One was brought to London as early as the year 1740.

The Chimpanzee is found in Equatorial Africa, but, unlike that of the gorilla, its range is very extensive, stretching from the Atlantic coast to the forest regions of the Nile. Five feet is a good height for a full-grown male; the average is nearly a foot less; and as with most other apes, there is little difference in the stature of the male and female. Besides being shorter, it lacks the breadth and general massiveness of the gorilla. The legs are comparatively straight, but the calf is only very slightly developed. Owing to less articulation of the hind extremities the animal is able to place more of the foot upon the ground than the gorilla. The fingers, like our own, are free as far as the knuckles.

The skin of the Chimpanzee, a light muddy flesh colour, is covered with coarse black hair, which is especially thick on the back and shoulders, and there are very passable whiskers on the sides of the cheeks. The skin of the face is inclined to yellow, but it darkens with age.

The head is large in comparison with the body. It is rounder than that of the gorilla; the ridges above the eyes are less marked; the jaws, though they project very much, are less massive; the canine teeth are less prominent; the lips are more mobile; and the nose is almost quite flat. Altogether the expression is one of considerable mildness.

There still remain several features worthy of notice. The ears are large, broad across the top, and project almost at right angles from the face. The animal possesses distinct stiff and bristly eyebrows, and the wrinkled lids are fringed with black eyelashes. The hair on the forehead is parted with an accuracy almost suggestive of the services of a hairdresser. On the upper arm the hair takes a down-

ward direction, which is the reverse of that on the lower arm, so that the tips of the hairs meet at the elbow. When it rains the Chimpanzee, in common with other apes, places its hands on its head, and the hairy arms thus form a kind of pent roof to shelter the face, the water dripping off at the elbows.

Though its home is in the forest the Chimpanzee is largely a groundling. It travels in strong bodies, chiefly in search of the soft fruits which form the main portion of its food, though it varies its diet with honey, grubs, and



SKULL OF THE CHIMPANZEE.

(One-third natural size.)

birds. Any plantain, banana, or corn plantations in the neighbourhood of a Chimpanzee colony will be sure to suffer from well concerted raids. It is difficult to catch them in their marauding excursions, for they are exceedingly watchful animals, and at the first warning cry from those on outpost duty they seek cover in the deep recesses of the bush.

The Chimpanzee is largely nocturnal in habit. During the night the forest resounds with the most hideous noises, probably a means of keeping the band together in the dark-

ness, while at the same time the outcries scare possible enemies. It affects no particular sleeping place, except when the female is nursing her young, at which times she prepares a platform upon which to secure some measure of comfort; but these nurseries are seldom used more than two or three nights in succession.

Ignoring the usually exaggerated stories of the natives, there is no doubt of the formidable nature of the Chimpanzee; it tyrannises over the district which it inhabits. The leopard and other members of the cat tribe prey largely on monkeys, but the leopard often finds its master in an adult ape. The lion kills the biggest Chimpanzee with ease, but we learn on the authority of Livingstone that it will not eat the body.

Captain Casati, the Italian traveller, relates many interesting facts concerning the Chimpanzee in the little known forests of the Aruwimi and Albert Nyanza regions. The most expert hunters experience difficulty in capturing the cautious animal. The Western Sandehs spread nets, and under cover of darkness disturb the apes with loud cries and the barking of dogs. The animals at once make a precipitate retreat, only to fall into the nets, in which their limbs become entangled. The hunters even then only effect their purpose after the most strenuous and dangerous struggles. The most successful traps of the Walegga tribe take the form of big jars of intoxicating beer, which are placed in the haunts of the Chimpanzees at night. With the dawn the animals fight furiously among themselves for possession of the jars, which the victors speedily empty. The drunkards eventually fall into a deep sleep, when the artful natives come out of hiding to tie the limbs of their deluded prey. At Msua, on the shore of Albert Nyanza, a body of troops was encamped in a dense wood. During the night a drum was taken from under the nose of a sentry, and the theft was assumed to be the work of a daring native. During the next day, upon the top of a tall tree an old Chimpanzee was discovered vigorously beating the drum with a stick, in imitation of the action which doubtless he had witnessed the day before. An attempt was made to recover the instrument, but the ape avoided

gunshots and darts by leaping from branch to branch until he finally escaped with his precious spoil.

Of all the greater apes, the Chimpanzee is the most human in appearance and intelligence, and if properly treated and trained it exhibits great docility. When young it is teachable, affectionate, and playful to a remarkable degree, but with age it becomes morose and increasingly savage.

As it endures our climate better than the other Anthro-poid apes, the Chimpanzee in captivity has given us fair opportunities of observing some of its characteristic habits. 'Tommy' was a fine and nearly full-grown animal who met his death in the great fire at the Crystal Palace in 1866. 'Jane,' an inmate of Sanger's Menagerie, was most popular with the spectators, and her keeper declared that she could do everything but talk. Greediness is usually a marked feature of the monkey tribe, but Jane would return a biscuit or a piece of cake if she were not hungry. A new set of teeth caused her much inconvenience and pain, and one tooth had to be removed to afford relief. The dental operation was performed with a piece of stick, and afterwards, whenever troubled with toothache, Jane would select a stout straw, break it off to the required length, and then present it to her keeper that he might again act as surgeon dentist. She eventually succumbed to the north-east winds and defective teething, the latter of which is always the scourge of wild animals in captivity.

All monkeys have an instinctive dread of cold, and the Chimpanzee easily learns to appreciate the utility of textile coverings. It will wear clothing with the utmost gravity, and takes a positive delight in a new garment, going to the length of destroying an old one to prevent the possibility of an exchange for the worse. So-called educated Chimpanzees will wear the clothing of a man, even to collar and tie, will sit at table to a varied meal, and will lie in bed between blankets and sheets with as little restlessness as is exhibited by the average child. These show animals, however, have little claim to real intelligence. They only go through what at best are their tricks while under the watchful eye of a trainer. The cleverest ape would no more dream of using

a knife and fork of its own initiative when feeding, than a caged lion would of its own free will amuse an audience by leaping through blazing hoops.

ORANG-OUTAN (*Simia satyrus*).

Coloured Plate I. Fig. 2.

The Orang-outan, literally Man of the Woods, inhabits the lesser known parts of Borneo and Sumatra, where it is called Mias by the natives. It attains a height of upwards of four feet ; the arms are long and the legs short. A man's



SKELETON OF THE ORANG-OUTAN.

extended arms usually measure exactly the height of his body when erect ; but in the Orang they are generally about twice the measurement of its height ; and thus in walking it is far more awkward than either the gorilla or the chimpanzee.

If the Mias is compelled to traverse an unwooded tract, it places its knuckles upon the ground and swings its body through the arms just as though they were crutches. It rarely attempts to walk on its hind legs alone, unless there are branches overhead to which it can cling for support. Among the trees the animal is just as nimble as it is awkward when on the ground. It can travel through the tree-tops quite as quickly as a person can run beneath them. It passes from branch to branch with great rapidity, and leaps intervening spaces with remarkable ease considering its size and weight. It enjoys a peculiar freedom of motion owing to the construction of its hip joint. In man and many animals the head of the thigh-bone is tied down to the socket by a short and strong tendon (*ligamentum teres*), which has to be cut before the cup and ball ends of the bones can be separated. The tendon adds strength, and is a security against easy dislocation. But in the Orang the ligament is entirely wanting, and its hind limbs can be turned in any direction with a flexibility and readiness that easily makes it the acrobat of the ape family. This remarkable suppleness of a large-bodied animal is exhibited in a marked degree in Plate I. Fig. 2.

Most monkeys are gregarious and delight in making deafening noises. The Orang does not even form little bands as do the gorillas, but mopes about upon its platform in marked contrast to the restlessness of the monkey tribe in general. It does not leave its bed until the sun is well up, and seldom returns to the same tree even two nights running. Fruit, leaves, buds, and young shoots form its food, and as it usually obtains sufficient water in the hollows of leaves, the animal finds but little necessity to come down to the ground.

Young monkeys of all kinds cling to their mothers even when they are leaping from branch to branch. Mr. A. R. Wallace, who with Rajah Brooke has afforded us our most reliable knowledge of the Mias, once killed a female, which was carrying a baby about a foot in length. When he went to pick up the little creature it instinctively grasped his beard and could not easily be made to loose its hold. Eventually it transferred itself to a piece of suspended buffalo

skin, which seemed to afford it almost complete happiness. A French traveller relates something similar concerning a little monkey which he removed from its dead mother in Dutch Guiana. When it was forced to release its parent it sprang upon a wig which was standing upon its block near at hand ; and not until the end of three weeks did it voluntarily allow the peruke to be worn by its owner.

A marked characteristic of the female Orang is its affection for its young, as exemplified in the following unpleasant incident that occurred when a distinguished scientist was endeavouring to procure a specimen.

In some trees, removed from the dense forest, a female Orang, with a young one in her arms, was discovered, and the pursuit commenced. In the ardour of the moment, and excited by the hope of possessing an animal so rare, the gentleman forgot everything but the prize before him, and urged on his men by the promise of a reward should their exertions be successful. The animal, encumbered with her young one, made prodigious efforts to gain the dense and intricate recesses of the wood, springing from tree to tree, and endeavouring by every means to elude her pursuers. Several shots were fired ; and at length one took fatal effect, the ball penetrating the right side of the chest.

Feeling herself mortally wounded, and with the blood gushing from her mouth, she from that moment took no care of herself, but summoned up all her dying energies to save her young one. She threw it onwards over the tops of the trees and from one branch to another, taking the most desperate leaps after it herself, and again facilitating its progress, until, the intricacy of the forest being nearly gained, her chances of success were sure. All this time the blood was flowing ; but her efforts were unabated. It was only when her young one was on the point of attaining to a place of safety that she rested on one of the topmost branches of a gigantic tree. True to her ruling passion, even in death, she turned for a moment to gaze after her young one—reeled, and pitched head foremost to the ground.

The sight was so touching that it called forth the sympathy of the whole party. The eagerness of the chase

subsided; but so deep an impression did the maternal tenderness and unexpected devotion of the poor Orang make on the leader of the party, that he expressed the utmost remorse and pity, declaring that he would not go through the same scene again for all the world.

THE GIBBONS.

The generic name 'Hylobates' is of Greek derivation; it signifies 'Tree-traveller,' and thus prepares us to expect that we are to deal with very active members of the monkey race. They are apes, or tailless monkeys, various species of which are found in India, Burma, Siam, Malay Peninsula, and the islands of Java, Borneo, and Sumatra. They are very slender animals, rarely exceeding three feet in length, and with arms that almost reach the ground when the animals stand erect.

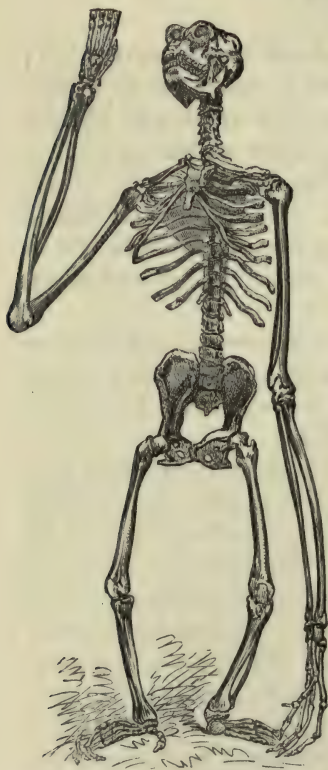
Three well-known species are the White-handed Gibbon (*Hylobates lar*), Coloured Plate I. Fig. 1, the Agile Gibbon (*Hylobates agilis*), and the Siamang or Ungka Ape (*Hylobates syndactylus*), Coloured Plate II. Fig. 4.

The Gibbons vary in colour—black, brown, grey, and cream colour—and some of them have a white band above or around the face. A mother does not necessarily have an infant the same colour as herself. The feet and hands of the White-handed Gibbon are always pale in colour. The soles of the feet of all the species are applied more flatly to the ground, but they cannot walk with ease or rapidity. All of them are shy and entirely arboreal, appearing to pass a life quite as aerial as many birds, omitting those feathered creatures which are too heavy or otherwise restricted from flying.

Owing to the construction of the feet and the length of the arms, these apes are able to spring from branch to branch in apparently the most reckless manner with a rapidity that enables them to capture birds on the wing. The Agile Gibbon flings itself from tree to tree a distance of no less than forty feet. During its gymnastic exercises it gives vent to loud cries, not altogether unmusical, but nevertheless dismal and melancholy in tone. Very few

specimens have ever found their way into captivity, for it seldom frequents the ground to afford an opportunity for its capture, and among the trees it is almost as difficult to catch as a bird.

In Sumatra the name of Ungka is frequently used for more than one variety of Gibbon. It properly belongs to the Siamang, which possesses a feature that is absent in its near relations. 'Syndactylus' signifies 'joined fingers,' and the Ungka ape has the first and second toes joined by a membrane as far as the second joint. The animal has a dark skin covered with stiff hair, which is practically jet black.



SKELETON OF THE SIAMANG.

Grave of manner and mild of temper, the Gibbons are easily domesticated. An adult Siamang on board a ship bound for England greatly interested the passengers. He was found to be fond of animal food, especially fowls. Spirits and wine he refused, but tea and coffee he accepted with avidity. He appeared to be still fonder of ink, and he constantly drained the inkstands and never omitted to suck a pen-nib that came within his reach. His temper was not easily roused, and his affectionate nature was constantly evinced in his fondness for play, in which he always preferred children to adults.

There were other monkeys aboard who refused to acknowledge the Siamang as belonging to their kindred. Probably they despised him on account of his lack of a tail. He speedily taught them that a caudal appendage may be a distinct disadvantage. He would seize one of

the disdainful creatures by the tail and then spring up into the rigging, dragging the unfortunate after him, regardless of its struggles. He would go through the performance with a gravity that was most amusing to the onlookers. The monkeys found it necessary to take united action against their tailless persecutor, but he usually eluded them with the greatest ease. He would seize a rope and swing from his pursuers, or he would walk along a cord, keeping his balance true with his arms like a tight-rope performer. He could spring from one rope to another with easy *abandon*, and even drop with unerring precision from a cord aloft to seize another that dangled far below.

FAMILY CERCOPITHECIDÆ.

All the remaining apes and monkeys of the Old World are included in the family *Cercopithecidæ*, *i.e.*, Tailed Monkeys, which is divided into two sub-families—the Cercopithecinae and the Semnopithecinae. They are similar in construction to the Anthropoid apes in many particulars ; but, with the exception of one or two species, they are provided with tails, which in the case of the Baboons are short, but in most instances are very long. It has been before remarked that the tail is never prehensile. Another great point in which these monkeys differ from the Simiidae is that the arms are shorter than the legs, which is the reverse in the most man-like apes. Indeed, the members of the Quadrumana with which we now have to deal are distinctly of a more quadrupedal nature, and in any case the long tail largely dissipates the resemblance to the human form.

Space alone will prevent even the mention of many monkeys, but the following present special points of interest, and are fairly representative of one of the most popular sections of the animal world.

Most of the monkeys that are exhibited in this country belong to the great genus *Cercopithecus*, and many of them differ in such slight particulars, often only in the shade of the hair, as to be indistinguishable except to a practised eye. Very well known species are the Green, the Vervet,

and the Grivet; and frequently the companion of the organ-grinder will be found to be one of the three.

GREEN MONKEY (*Cercopithecus sabæus*).

Coloured Plate III. Fig. 2.

The Green Monkey, a native of Western Africa, is one of the commonest of imported monkeys. It is a handsome species, in colour a general olive-green, as its name denotes, with black hands and face; the hairy fringe at the sides of the face is almost a golden yellow. The greenish tinge is particularly noticeable when the sun shines on it. Under the microscope a single hair is seen to be really yellow with bluish black bands at intervals; and thus the green is but the optical blending of two separate colours; and by means of coloured liquids a child can easily demonstrate that blue and yellow, when mixed, produce green.

PIG-TAILED MACAQUE (*Macacus nemestrinus*).

Plate II. Fig. 1.

The Macaques are tolerably well known animals, various species of which are plentiful in the lands which they inhabit, and they lend themselves with considerable readiness to domestication. Being hardy of constitution, they are often seen in our own country, and share with the Green Monkey and its kin the doubtful privilege of being exhibited and taught to perform various tricks. Two of the best known are the Rhesus or Bhunder Monkey (*Macacus rhesus*) and the Bonnet Monkey (*Macacus radiatus*).

The Pig-tailed Macaque is trained by the natives of the Far East not only to climb cocoanut trees, but also to select with great care the ripest fruit and throw it to the ground below, where it is collected and stored by the animal's trainer and owner. The animal receives its name from the fact that its tail is short and slender and bears more than a little resemblance to that of a pig.

Plate III.



1. Aye-Aye



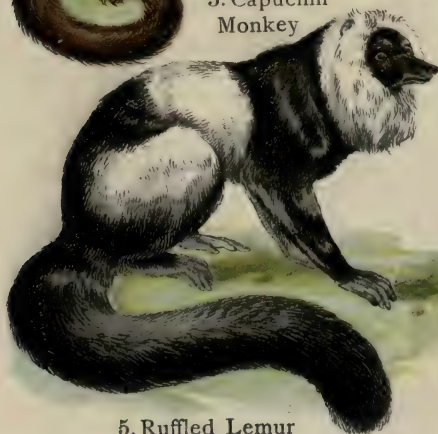
2. Green Monkey



3. Capuchin
Monkey



4. Slender Loris



5. Ruffed Lemur



6. Hanuman Monkey

BARBARY APE (*Macacus inuus*).

Coloured Plate II. Fig. 2.

The Macaques are chiefly found in India, China, Japan, and the Malay Archipelago; but the Barbary Ape, popularly called the Magot, inhabits North-west Africa, and is particularly interesting in that it is the only example of the monkey tribe which is found in Europe, where it is confined to the Rock of Gibraltar. How it came there is not known with any certainty. Ages and ages ago Gibraltar and North Africa were joined by a narrow neck of land, just as England and France were connected where is now the Strait of Dover; and as the climate of the South of Spain is practically that of Northern Africa, there would be no cause for wonder in the Barbary Ape taking up its quarters there. It is, however, far more likely that the animal was introduced into Spain by the Moors when they conquered the country in the eighth century; or the present Gibraltar apes may be descendants of tame ones that escaped from captivity to renew their wild life.

The Magot is largely dog-like in appearance; it measures upwards of two feet in length, and is generally about the size of a bull terrier. It has large cheek pouches which it loses no opportunity of stuffing with food. Its coat is grey with a yellowish tinge; it is quite tailless. Some of the Asiatic Macaques have a ruff of long hair round the neck, but in the Magot it is comparatively short.

In North Africa the animal is quite common, and it does much damage to crops in Algeria and Morocco. On the Rock it often plays havoc in the gardens, and it would not be tolerated but for the amusement it affords, though owing to its shyness, its antics can only be well observed through a good telescope. Sometimes it has been found necessary to thin their numbers; on the other hand, the European specimens would at some periods have died out but for the introduction of fresh blood from Africa. The animal is gregarious, and sometimes considerable numbers of them can be seen climbing the precipitous sides of the Rock, the females carrying their young on their backs, as they search for lizards and insects.

Many amusing stories are told of these monkeys, of which one must suffice. One night a sentry was suddenly roused to a sense of imminent peril: the Rock was in danger of being lost to the British Empire. Just before the dawn he became aware of a strange figure from which came most puzzling metallic sounds. Receiving no reply to his stentorian challenge, the sentry fired at the dimly outlined figure and dropped it in its tracks. The garrison sprang to the call, the guard turned out, only to find a poor Magot in its death-agony. The creature had broken into one of the kitchens and had put its head into a cooking utensil, from which it was unable to withdraw it. In its struggles to get rid of its unwelcome headgear the ape happened upon the sentry, to fill his mind with instant fear of some dark scheme to rob us of one of our most cherished possessions.

WANDEROO (*Macacus silenus*).

Plate III. Fig. 2.

A remarkable species is the Wanderoo, which the Ceylonese call Nil Bhunder, *i.e.*, Black Monkey, on account of the colour of its long fur. On the top of its head the hair is particularly long, falling on either side of its face like the full-dress wig of a judge. It also possesses a long grey beard, so that it has quite a venerable aspect. Unlike the other Macaques, it has a tuft of hair on the end of its tail, much like that of a lion. The Wanderoo is furnished with cheek pouches of considerable size; and probably the rapidity with which it feeds is due to the fact that it is storing away a portion of its food for future use. The animal stands quite thirty inches high, weighs as much as 80 lbs., and is possessed of considerable muscular power.

YELLOW BABOON (*Cynocephalus babuin*).

Coloured Plate II. Fig. 3.

Of all the monkey tribe, none are more brutal, ferocious, or disgusting than the Baboons, which are large African apes, two or three feet in length, and about the same in

height. The generic name *Cynocephalus* means Dog-headed, and Baboons differ from all the rest of the monkey family in the muzzle, which is elongated into a snout pierced with nostrils at the end like a dog. In fact, the face generally resembles that of the dog, and the likeness is increased by the animal seldom walking, or even standing, other than on all fours. Their front and hind legs being differently proportioned from those of the Simiidae, they can run swiftly along the ground, and yet can climb rocks and trees with an agility equal to that of almost any quadrumanous beast. Some species possess tails of considerable length; in some it is the merest stump, with an erect tuft of hair. The hair is long, and often on the upper parts there is a kind of mane, which becomes grey in the animal's later years.

Like most of the monkeys of the Old World, Baboons have callosities on the buttocks, and they also possess the cheek-pouches with which so many monkeys are provided. A Baboon's pouches are of sufficient size to hold seven or eight eggs without inconvenience, allowing it to eat them at its leisure one at a time.

In the Baboon there is nothing of the gentleness of the mias or gibbons, nothing of the amusing vivacity of monkeys generally. The eyes are small, close set, deeply sunk, and with a horribly sinister expression that gives the animal a most repulsive appearance, in strict keeping with the fierceness which is the distinguishing feature of its character.

Various species attain a large size, and possess such strength that they can rarely be taken alive except when very young. They are quite dreaded by the inhabitants, for the animals herd themselves together in great numbers and work much mischief to plantations and crops. The Baboons are the least arboreal of all the Quadrumana. They live chiefly on roots and fruits; those that inhabit rocky regions feed largely upon insects, lizards, &c., easily devouring scorpions, which they first cleverly deprive of their stings.

The Chacma or Pig-faced Baboon (*Cynocephalus porcarius*) of South Africa, when it runs short of its ordinary food,

will raid the maize crops of the farmers with as much organised method as a foraging party of soldiers would obtain food supplies. Led by an old male, the whole Baboon settlement moves at once, with the females and the young ones in the middle, and the vanguard, rearguard, and flankers under strict discipline. Scouts are thrown out to prevent the party being surprised, and when the scene of operations is reached, sentries are duly posted to keep a sharp look-out on every side. The marauders eat their fill and then retire with as much plunder as they can carry ; and even if they are disturbed there is no disorder in their retreat. The sentinels take no part in the actual foray, from which it is evident that the rest of the band make due provision for their needs.

Dogs are usually employed by farmers to hunt the apes, who sometimes terrorise over a whole district. Individually a dog is no match for a Baboon, who will seize its enemy by the hind legs and whirl it round and round until it is too giddy and stupefied to take further part in the hunt. At close quarters the animal's teeth make it a dangerous foe ; when pressed, it will retreat and cast stones at its opponents.

In captivity the Baboon is equally cunning, mischievous, and revengeful. Its keeper is never safe from its jealous, vindictive temper. In one instance, a menagerie attendant was playing with a neighbouring animal, when a Baboon in a paroxysm of fury forced asunder the bars of its cage and grasped the unfortunate man by the neck. Before the sinewy hands could be removed the man was strangled to death.

Everything that has been said of Baboons in general, or the Chacma in particular, is applicable to the Yellow Baboon. Its coat is mainly yellowish in colour ; the face and any bare parts are bluish black. Its tail is of greater length than in most other species of the genus.

Baboons are also found in Arabia, Persia, and the mountains of Abyssinia. It was probably the Thoth, or Abyssinian Baboon, that was viewed by the ancient Egyptians with a certain amount of reverence. There appears to be no real proof that it was actually worshipped. It is true that its figure is often found depicted in sculptures,

and Baboon mummies show that its body was embalmed ; but it does not follow that the animal was an object of idolatrous worship, any more than is the lion of England, the dragon of St. George, the eagle of France, and a host of other animal forms that are used as national emblems.

On the West Coast of Africa a troop of Baboons one night swooped down upon a station and carried off a baby while the nurse was absent from her charge. It is easy to imagine the mother's agony of mind while she waited hour after hour for the return of the party of men who had set out to rescue the child. They were unsuccessful, and could do nothing further until daylight. The father of the child was on a visit to a distant settlement and was in ignorance of the incident. Providentially, as he returned home, he encountered the Baboons, and in the moonlight he saw that the biggest one carried a bundle from which was emitted a little cry. The next moment the officer spurred his horse to charge into the midst of the apes, intending to ride down the one that carried the bundle. When the big brute dropped it to escape into the bush, the man dismounted, to find that he had rescued his baby boy, fortunately no whit the worse for the terrible experience.

It is claimed for the Baboon that it can be trained to render useful service to man. It has been taught to draw light vehicles ; colonists have utilised it to serve as a watchdog on lonely farms ; and on a South African railway a lame employee taught a tame animal to set the signals. The Baboon is certainly sufficiently strong to perform even rather laborious tasks, but its uncertain temper will always prove a bar to its useful employment.

MANDRILL (*Cynocephalus mormon*).

Coloured Plate II. Fig. 5.

The Mandrill, or Rib-nosed Baboon, is extraordinarily hideous. It approaches a stature of three feet ; its bulk is great and its strength tremendous. It is the largest, most ferocious, and most powerful of the whole genus. Its

general colour is light olive-brown, silvery grey underneath, and the hair on the head not infrequently stands almost on end to form a pointed tuft. The face is as remarkable as anything that can be found in the whole of the animal creation. The cheek bones of the male are elevated on each side, with oblique ridges of a brilliant blue. Between the blue masses is a wide stripe of scarlet extending to the end of the snout. The callosities on the hinder part are usually of a vivid scarlet hue, assisting to make the Mandrill still more repulsive.



SKELETON OF THE MANDRILL.

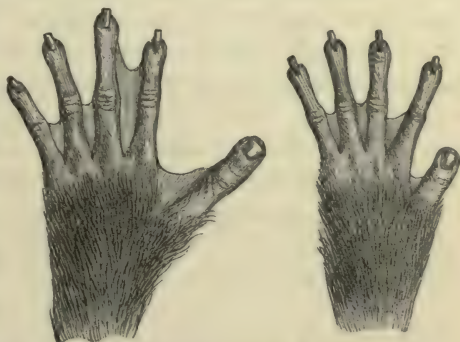
Even if taken young it is not easily domesticated, though, like most animals, it can be rendered comparatively docile by kind but firm treatment. A Mandrill was for a long time an object of interest at Exeter Change. He would sit in a chair with great gravity while he smoked a pipe ; it was doubtful whether he relished tobacco, but it was very certain that he had a special fondness for gin.

But even in captivity the animal will suddenly exhibit the most violent fury without any apparent reason, and

by various gestures and actions will evince the utmost malignity. Any shrinking or sign of timidity on the part of a spectator is sufficient to cause it to make a still more violent demonstration, as if it were anxious to inspire further fear. In a wild state, notwithstanding its strength and ferocity, it is at heart a coward, and if opposed boldly will promptly retreat, to wage the contest at a distance with missiles. Terror, or an attempt at flight, on the part of the animal it attacks brings about inevitable destruction the moment the Mandrill perceives its advantage.

There are other equally interesting species of the genus *Cercopithecus*. The Diana Monkey (*Cercopithecus diana*) receives its name from the crescent-shaped patch of white fur upon its forehead, which is very similar to the crescent which ancient sculptors placed upon the forehead of the goddess Diana. The monkey's black pointed beard, however, rather detracts from the resemblance to the august pagan deity. The Diana is one of the most beautifully coloured creatures in the monkey world, the back being chestnut brown, the chest white, while the rest of the body is of a golden hue with a reddish tinge.

The White-nosed Monkey (*Cercopithecus petaurista*) has a white nose and a fringe of white hair surrounding its face, which quite distinguishes it from any other species. Another small group known as Mangabeys were originally named in the belief that they were natives of Madagascar, whereas they are restricted to Western Africa. Their distinguishing feature is white eyelids, for which reason they are often called the White-Eyelid Monkeys, Plate III. Fig. 1. The White-collared Mangabey (*Cercocebus collaris*)



FOOT AND HAND OF THE MANGABEY.

possesses the white eyelids and also a frill or ruff of long white hair. Active and amusing in captivity, the Mangabeys are full of pranks, and at making faces they have no equal. They walk on all fours, bending the tail backwards until the tip quite overhangs the head.

PATAS OR RED MONKEY (*Cercopithecus patas*).

Plate II. Fig. 2.

The Patas, or Red Monkey, is common to West Africa, especially in the Senegal region. It is a pretty animal with yellowish-red fur, becoming lighter on the under parts; on the forehead is a black band with white crosses. It is violent and malicious, and by no means a favourable specimen of its race. That it is curious, mischievous, and possessed of a determined spirit of retaliation, is well shown in the account of a traveller who passed through the forest wilds which the Red Monkey makes its home.

When the explorer and his party passed along the river in boats, the creatures descended from the tops of the trees to the extremities of the branches the better to investigate closer the novel spectacle. Not satisfied with this, they commenced offensive operations and threw pieces of wood and other missiles at the invaders. At first the travellers were amused, but the flight of missiles developed into a perfect bombardment that made progress well-nigh impossible. When fired upon, the creatures uttered frightful cries; and although many fell, the survivors returned again and again to the attack with the utmost perseverance and resolution. At length the monkeys realised the inequality of the contest and retired to allow the travellers to continue their journey in peace.

The genus *Semnopithecus* is not nearly so numerous in species as the *Cercopithecus*, nor are any of its representatives so well known in our country as are many of the latter. If the *Semnopithecus* tribe only knew it, they might congratulate themselves upon the fact that they are so little

known in England; for while monkeys in zoological collections are well treated, there is every reason to believe that the simian assistants of the barrel-organ grinder are taught their tricks by fear rather than kindness.

HANUMAN MONKEY (*Semnopithecus entellus*).

Coloured Plate III. Fig. 6.

It must be remembered that the Israelites of old reared up the golden calf of idol homage at the very time when God was affording special evidences that they were His chosen people. While there may be uncertainty whether the Egyptians worshipped the baboon, there is no room for doubt that for long ages the Hindus held in sacred reverence various members of the brute creation. Even under modern conditions of life, closer association with Western peoples, and the spread of Christianity, the worship of animals still remains, though with less revolting features than was formerly the case.

The Hanuman Monkey is supposed by the Hindus to be a visible incarnation of the god Vishnu, and consequently the temples dedicated to the god are happy havens for this particular species. They simply swarm about the cities and villages where Vishnu is worshipped. The beautiful carvings of the temples and even the holiest idol shrines are defiled by the jabbering creatures, who, not content with the offerings of the faithful, rob orchards, pilfer from fruit stalls, and even enter shops in search of delicacies. No native would dream of taking active offensive measures against the four-handed robbers. Efforts have been made to get rid of this holy scourge by deporting large numbers of the monkeys to certain fertile spots, specially purchased and cultivated for them; but the monkeys prefer town life, and usually contrive to return to the temples. In a city in the North-west Provinces two English officers were attacked by several monkeys in one of the chief thoroughfares. Purely in self-defence the white men wounded one of the sacred animals, which immediately raised the anger of the priests and pilgrims. A fanatical mob gathered,

the Englishmen were seized, thrown into the river, and drowned.

In build the Hanuman is slender, measuring about two feet in length, with a tail quite as long as the body. Its fur is greyish brown, with a line of a darker shade along the back; but as the animal increases in years black hairs sprinkle its coat, darkening it in colour.

PROBOSCIS MONKEY (*Nasalis larvatus*).

The Proboscis Monkey, or Kahu, is a native of Borneo. In size it is about equal to the Hanuman, but thanks to its enormously lengthened nose it is by no means so presentable an animal. But if the Kahu's countenance is almost preternaturally ugly, the same cannot be said of the beautiful colouring of its coat. The body is principally a bright chestnut red, deepening into a rich brown tint on the head and between the shoulders, while the arms and legs are several shades lighter. The sides of the face and the under parts of the body are golden yellow. The tail is a yellowish white. The animal is an agile creature, leaping fifteen feet or more with ease as it travels through the trees in small companies.

We now come to Group II., the PLATYRRHINI (Wide-nosed Monkeys), the monkeys of the New World. Unlike those of the Eastern hemisphere, they have less projecting faces, the nostrils are wide apart, and there is an absence of cheek pouches and callosities. The thumb, where it exists, is not opposable and the tail is long and in most cases prehensile. Except in a very few instances they are smaller than those of the Old World, which have been described at such length as to render unnecessary any detailed account of the American animals, except where they possess some specially noticeable feature.



A PLATYRRHINE MONKEY.



1. MANGABEY.
(See page 61)

2. WANDEROO.
(See page 56)



1. SPIDER MONKEY.

2. COMMON MARMOSET.

(See page 69)

(Photos W. S. Berridge, F.Z.S.)

SPIDER MONKEYS.

The Spider Monkeys are grouped together in a genus to which has been given the name *Ateles*, which betokens the deprivation of joints : some of the animals possess no thumb and in others it is very rudimentary. To their small bodies is attached a diminutive head, long, slender limbs, and a very long prehensile tail. There is no wonder that a humorous writer likened the Spider Monkey to five black ropes tied in a knot to represent the head and body, the dangling rope-ends being the legs and tail.

A prehensile tail is in reality a fifth hand, and why Nature should have denied the Old World monkeys such an advantage is inexplicable. A prehensile appendage is nearly as useful to a monkey as is a trunk to an elephant. If the former discover some dainty, such as eggs or insects, in a cranny too small to allow it to insert a paw, the end of the tail is requisitioned to hook out the desired object.

Thick and strong where the tail is united to the body, it rapidly decreases in circumference towards the end, where it is very slender and devoid of hair on the under surface to allow of a nicer application in grasping. Quite involuntarily it forms a hook-like curve, just as readily as the claws of a bird contract when in the act of perching. It is next to an impossibility for the monkey to fall, for it seldom moves without twisting the tail round a branch. Even when shot it will hang by its appendage until long after death—in some cases until decomposition sets in.

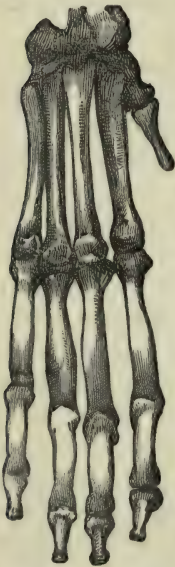
On the ground the Spider Monkey cannot walk on its hind feet, but it can run upon them for a few yards, balancing itself by raising its long arms over its head, and still more by bending the tail over its back in the shape of the letter S.

A traveller relates an incident of which he was an eyewitness. He was exploring a stream that flowed into the Amazon, and had reached a point where the trees on the banks nearly met overhead. It was not prudent to proceed or return in the dark, and the boat was anchored in mid-stream.

'The air was full of strange sounds, made by birds and

insects, which kept me awake until just before the dawn, when I fell asleep in my chair on the deck. Suddenly I felt a rough blow on my face, and became wide awake. I saw hanging from a tree, and swinging into the gloom, something that looked like a huge black rope. The end of it had struck me. In a moment back it came, swinging this time behind the vessel.

'The rope gave forth a chattering noise ; it was alive. A moment more, and it was clear to me that here was a company of monkeys trying to cross the stream. The sight was so novel, the plan so daring, that at once I gave these queer bridge-makers my closest attention.



HAND OF A SPIDER
MONKEY.

'They were hanging from a tall palm-tree that leaned out over the water ; there was a line thirty feet long, and three or four monkeys deep, holding on to each other as if the fate of the monkey race depended upon them.

'Little by little the breathing, clinging pendulum kept gaining. Very soon it swung out so far that the leader caught a branch of a tree on the opposite bank, when, lo ! there was a bridge in mid-air. At once there rose from all the line a chattering that must have been monkey cheers.

'Without further ado the bridge was opened to the monkey public, and out of the palm-tree came a noisy crowd of all ages. They ran across the bridge as best they could, some on all fours, some upright, some with young monkeys on their backs, and all waving their tails and briskly jabbering.

'The last one to cross was evidently a patriarch of the colony, for he picked his way along so slowly and nervously that I could not help laughing outright. Hearing so unusual a noise, the monkeys that were clinging to the palm did not wait for him, but let go and swung over to the other side. The old fellow narrowly escaped a ducking.

‘No sooner had the bridge cleared the water than the monkeys loosened their grip of one another. In less time than it takes to tell the story, the bridge dropped to pieces, and—what never happens to a common bridge—the pieces betook themselves to the tops of the trees, and were soon out of sight in the depths of the forest.’

COAITA (*Ateles paniscus*).

One of the best examples of the Spider Monkey is the Coaita. It is one of the largest of the genus, mainly black with a pink face. Mild and gentle, it is a great favourite with the pet-loving natives of Surinam and Guiana. The monkeys themselves have no cause to be thankful for this fondness, for monkey-flesh is a popular dish. Monkeys are not greatly esteemed as food in the Old World, although they are eaten in some regions for lack of something better; but in many parts of South America, especially the valley of the Amazon, they figure largely in the everyday fare of the natives. Mr. Wallace found the meat to be not unlike rabbit, but European travellers, when obliged to utilise the monkey, will never consent to serve the head and hands at their tables on account of their hideous resemblance to those of a child. It is not at all improbable that savages have sometimes been accused of cannibalism when they were only indulging in their liking for the quadrumanous beast. The species presented on the plate is the Variegated Spider Monkey (*Ateles variegatus*), Plate IV. Fig. 1.

RED HOWLER (*Mycetes seniculus*).

Coloured Plate II. Fig. 1.

A near relative of the Spider Monkey is the Howler, different species of which vary in length from a foot and a half to three feet, the larger ones being strong and ferocious to a degree. They inhabit the north-eastern parts of South America, and are the largest monkeys in the New World. In nature and disposition they are allied to the baboons. The Red Howler is clothed with red hair, lightening into

yellow ; its face is black and naked, and that of the adult male is surrounded by a profuse beard.

The generic Greek word *Mycetes* means 'to moan,' and is applied to the animal on account of the peculiar construction of the throat, which enables it to emit the most extraordinary sounds. The hyoid bone forms a hollow drum communicating with the larynx, and gives such prodigious power and resonance to the voice that the animal can make hideous noises that can be heard miles away. The Howlers live in troops, and swing their way through the woods with great agility. It is chiefly at night that they practise their vocal exercises. Waterton, the celebrated naturalist, thus describes the effect : 'Nothing can sound more dreadful than its nocturnal howlings. While lying in your hammock in those gloomy and unmeasurable wilds you hear howling at intervals from eleven o'clock at night until daybreak. You would suppose that half the wild beasts of the forest were collecting for the work of carnage. Now it is the tremendous roar of the jaguar as he springs upon his prey ; now it changes to his deep-toned growlings as he is pressed on all sides by superior force ; and now you hear his last dying moan beneath a mortal wound.'

CAPUCHIN MONKEY (*Cebus capucinus*).

Coloured Plate III. Fig. 3.

The Capuchin Monkey is one of many similar species found in nearly all the forests of tropical America, from which it differs only in being destitute of the raised crest which is a conspicuous feature of many monkeys in the same genus. It is usually about a foot in length, with fur variable in tint, but more often than not it is a golden olive, with a white border round the face. Lively and playful, the Capuchin is a favourite with the natives and with the European settlers. In common with many of the smaller monkeys, it frequently sets up a friendship with other animals in and about the house. It will become the firm friend of a cat, and will often seat itself upon the back of a pig and bstride its unwilling steed even when it is feeding

in the savannahs a long distance from home. Italian organ-grinders prefer this monkey almost to any other. Usually it is quite harmless, but its temper is unreliable. Sometimes, without provocation, it will spring upon a bystander and inflict a nasty bite before the victim is aware of the animal's purpose.

There yet remain various monkeys of more or less interest, deserving of some extended notice did space permit. The Saki, elegant in form, is clothed with long furry hair, which doubtless serves a very useful purpose in saving it from the stings of wild bees when the animal raids the nests in search of honeycomb, which is its favourite food. One species (*Pithecia chiropotes*) is called the Hand-drinker, because it does not apply its lips to the liquid, but takes it up in the hollow of its hand and thus conveys it to its mouth. The Douroucoulí (*Nyctipithecus trivirgatus*) is the owl of the monkey race. It spends the hours of daylight in a deep sleep, from which it cannot be roused even to avoid capture. But at night it becomes filled with life and spirit, and captures not only birds in the trees, but winged insects as they flit by. Lastly, we come to two little animals with which our inquiries into the Anthropoidea must come to an end.

MARMOSET (*Hapalè Jacchus*).

Plate IV. Fig. 2.

One of the few monkeys that can with truthfulness be termed pretty is the Marmoset. There are several species, and all are beautiful, with the gentle, engaging manners which have earned for them the generic name of *Hapalè*, or sweet. Only seven or eight inches long, or about as big as a full-grown rat, the thick, soft fur and the long, bushy tail, a foot in length, give it the aspect of a considerably larger animal. The colour of the coat is a peculiarly rich brown, which appears quite ruddy when the hairs are blown aside. The tail, which is not prehensile, is light grey, ringed with black, and there is a prominent tuft of white hair on either side of the head, standing out before the ears. The

Marmoset has claws instead of nails except on its great toe. Its voice is a low, gentle whistle, quickly repeated when alarmed, for which reason the French settlers call it Ouistiti.

The Marmoset is common in many parts of South America. Its chief food consists of fruit, but it is very fond of insects. A visitor to the Zoological Gardens will find that the little animal will accept a biscuit or a nut, but it will view him as a positive benefactor if he will catch a few flies and pass them into the cage.

LION TAMARIN (*Midas rosalia*).

The Tamarins are called the Silky Marmosets. They are very general in the forests of the Amazon. The Lion Tamarin, in colour, is rather yellower than our common squirrel. Its naked face set in the midst of a circular mane gives the little creature a more than passing resemblance to a tiny lion—hence *leoninus* is another specific name. In common with the Marmosets, the Tamarins can be easily tamed, and consequently are often kept as pets.

SECTION II.—LEMUROIDEA.

We now pass from the Monkeys, by a very natural transition, to a singular race at the extreme end of the quadrumanous animals, which appears to connect the higher anthropoids to the genuine quadrupeds. The appellation of Lemur (Lat. *lemure*, a ghost) was given to them on account of their nocturnal habits. They are restricted to the island of Madagascar, which, though close to Africa, well wooded, and with a favourable temperature, strangely enough does not possess a single species of genuine monkey.

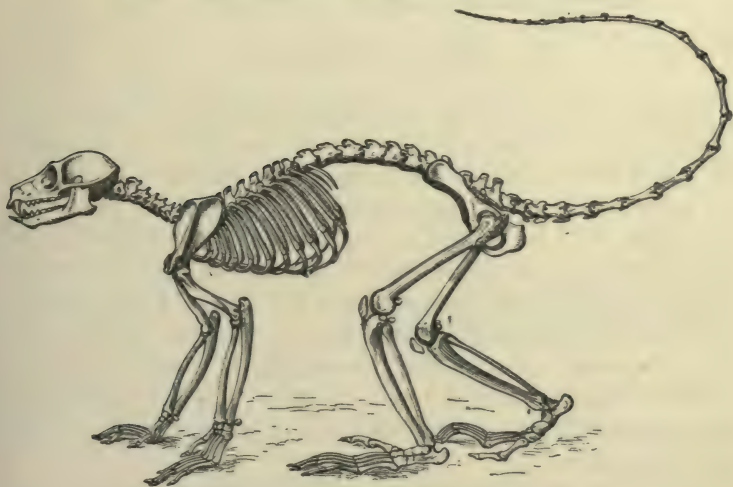
In disposition gentle, and in habit active, the Lemurs display neither the vivacity, cunning, nor curiosity of the monkey, to whom they are certainly inferior in intelligence. In size they are generally equal to a large cat, and, indeed, the name Madagascar cats is often applied to the whole race. The muzzle is long and pointed; the fur woolly; and the second fingers or toes have claws, instead of being furnished with nails as are their other digits. The

eyes are enormously large to allow the animals to see their food in the dark. The fingers are tipped with soft pads, by which the animals are enabled to move among the branches in absolute silence. The teeth possess some characteristics of those of the insectivorous quadrupeds; and when they bite, the wound, from the length and cutting edge of the canine teeth, is very serious. In the daytime one finds the Lemurs in the Zoological Gardens usually curled up asleep in their cages. In captivity their food is usually bread and various fruits; but in a wild state they add lizards and small birds to their frugivorous diet. They take up their food in their hands like monkeys, but without raising themselves up or sitting on their haunches.

RUFFLED LEMUR (*Lemur varius*).

Coloured Plate III. Fig. 5.

Though it is the most striking and handsome of its race, the Ruffed Lemur is fairly typical of the ten species found



SKELETON OF THE RUFFLED LEMUR.

in Madagascar. The Red Lemur (*Lemur ruber*), the Black-faced (*Lemur nigrifrons*), the Collared (*Lemur collaris*), and

the Ring-tailed (*Lemur catta*), as their names imply, possess notable features of difference in their general appearance. The black and white in almost equal proportions of the Ruffled variety are in sharp contrast; and the large ruff round the neck and the great bushy tail, not unlike a lady's black fur boa, add greatly to the elegance and the *tout ensemble* of the whole figure. When sleeping, all Lemurs curl themselves into a ball and coil the tail round the body to keep it warm. If several Ring-tailed ones inhabit the same cage they sleep together, clinging closely to each other, and wrapping their thinner tails impartially round themselves or their friends until it is impossible to distinguish the owner of any particular appendage.

The last group of the Quadrumana are the Lemuroids, *i.e.*, Lemur-like animals. At one time they were confounded with the true Lemurs, but they inhabit different countries and exhibit marked characteristics.

BROWN MOUSE LEMUR (*Chiogaleus mili*).

Plate V. Fig. 2.

The Mouse Lemurs are among the smallest of their tribe, some, at least, of them being less in size than an ordinary rat. Not a few of them are hibernators, becoming dormant not in the coldest, but in the hottest period of the year. In later pages will be found references to the hibernation of various animals, most of which become extremely fat just before they retire for a season; but the Mouse Lemurs store up fat only in the region of the base of the tail. The Brown Mouse Lemur is only about two-thirds of a foot in length, to which must be added the long tail. The greyish-brown fur is remarkably fine and silky; it is white on the throat and underparts.

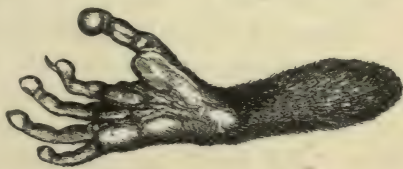
The Dwarf Mouse Lemur is only half the size of the foregoing. The most marked feature of the little creature is its beautifully brilliant eyes. In the top of a tall tree it constructs a nest which in size and appearance might easily be taken for that of a rook.

SLENDER LORIS (*Loris gracilis*).

Coloured Plate III. Fig. 4.

The Slender Loris is a small animal only eight or nine inches long, which gains its name on account of the delicate slenderness of its limbs. It has no tail, and its arms and legs are very long. It sleeps during the day, but at night it is a terrible enemy to birds, upon which it feeds in addition to fruit and insects. Its movements are the acme of stealthiness; there is nothing to indicate its presence save its big round eyes gleaming like phosphorescent fire. Like a flash it seizes its feathered prey and bites off its head before the bird is aware of the presence of danger. Though during daylight the animal lies rolled up in a ball upon a branch, there is no likelihood of it falling; for the muscles and tendons of the legs automatically contract to grasp the perch. The Slow Loris (*Nycticebus tardigradus*) is of similar habits. It is known by many names, of which Kukang is a common one; but Anglo-Indians usually call it Bashful Billy.

There are also the Galagos, another singular tribe of animals peculiar to Africa. They possess the main characteristics of the Lemuroid group, with the addition of large membranous naked ears, the powers of which are remarkably acute. Their manners are those of monkeys and squirrels; they perch among the foliage of trees, where they pursue their insect food, which they capture with the hand. Like squirrels, they make nests in which they rear their young ones.



SOLE OF FOOT OF GARNETT'S GALAGO.

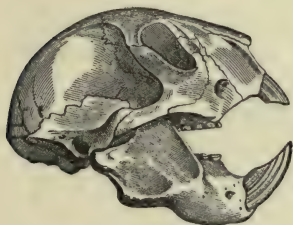
In zoological collections the Maholi Galago (Plate I. Fig. 1), with its delicate woolly fur, is always an interesting captive. It feeds on bread, fruit, and milk, but meal worms afford it special pleasure. So quickly will it snap them up with its forepaws and convey them to its mouth that it is difficult for the eye to follow the movements.

The Tarsier (*Tarsius spectrum*), which is found in Borneo, Sumatra, and Java, is a similar nocturnal animal, with arms much shorter than the legs and a tail longer than the body. Two of the toes, the second and third, of the hind foot possess claws, but the fingers and other toes are furnished with nails.

AYE-AYE (*Chiromys Madagascariensis*).

Coloured Plate III. Fig. 1.

The Aye-aye is an extraordinary animal, found only in Madagascar. The generic name is derived from two Greek



SKULL OF THE AYE-AYE.

words, one of which signifies a hand and the other a mouse. The Aye-aye is rather rare, even in its native home. When in 1780 a celebrated traveller, Sonnerat, discovered it, the natives who accompanied him were evidently unaware of its existence, for they cried out in astonishment, 'Aye ! Aye !' The discoverer at once

adopted the exclamation as the name of this hitherto practically unknown creature.

When brought to Europe the animal caused more than passing interest because of the doubt how best to classify it. It possesses enormous incisor teeth, a distinguishing feature of the rodents, and, in fact, the Aye-aye bites deeply into trunks and branches in search of grubs, which form a large part of its food. The difficulty, however, does not end there. The limbs are undoubtedly quadrumanous ; the monkey-like foot has an opposable toe ; but the hand is peculiar to the animal and quite unlike that of any other known creature. The thumb is small and insignificant ; the fingers are slight and of great length, with the middle one almost like wire in its degree of attenuation. The movement of this wiry middle finger is quite independent of the others ; it can be used when the other fingers and thumb remain closed. Its purpose is to pick out of the



1. COLUGO.

2. BROWN MOUSE LEMUR.

(See page 72)

timber the grubs and insects which the incisor teeth have disclosed. The animal is about a yard in length, including the tail. In colour it is nearly black, with the cheeks, throat, and underparts a light grey. The brownish eyes are very sensitive to light. It builds a globular nest of dry leaves at some height from the ground. The natives view the animal with superstitious dread, believing that any one who touches it will die within the year, and this fact has not rendered it easier to learn reliable particulars concerning the Aye-aye's life and habits.



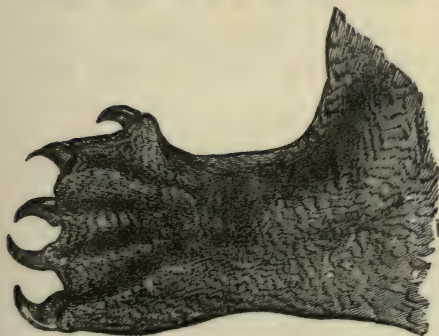
FOOT OF AYE-AYE.

HAND OF AYE-AYE.

COLUGO (*Galeopithecus volans*).

Plate V. Fig. 1.

The Colugo or Flying Lemur, the last member of the Quadrumana, is also a matter of dispute among zoologists, some of whom would place it among the Insectivora, while others insist upon it forming an entirely separate order, the Dermoptera, or skin-winged animals. There is in any case only one family and



HIND FOOT OF THE COLUGO.
(Four-fifths natural size.)

one genus of these creatures, of which the common Colugo is best known. In construction it is very similar to the Flying Squirrel and the so-called Flying Opossum of Australia, in which the skin of the flanks is flattened and extended to buoy up the animal in the air like a parachute. When full grown the Colugo is about the size of a cat, and in colour it varies quite as much as does the latter.

In some respects the Flying Lemur, or Cobego, as it is also called, bears no little resemblance to the members of the Chiroptera, the succeeding order. The flying membrane is not at all unlike that which forms the wings of the bat; and the Colugo sleeps head downwards, suspended by its hind feet, which is quite a general feature of the Bats. In its powers of flight, however, the Colugo falls short of the bat, since it cannot attain a higher elevation than that from which it starts. In its progress the creature's rate of descent is about one foot in five, but it possesses the power of directing its flight to any given object.



BONES OF HIND FOOT OF
THE COLUGO.

Mr. Wallace says that he saw a Colugo run up a tree to a height of forty feet, from which it took a leap of seventy yards to another trunk, the animal having clearly guided itself to its goal.

Chapter IV

ORDER II.—CHIROPTERA (BATS)

General description of the Chiroptera—Long-eared Bat—Pipistrelle Bat—Barbastelle Bat—Whiskered Bat—Horseshoe Bats—Mouse-coloured Bat—Fruit Bats—Kalong—Vampire Bat—Bat guano.

CHAPTER IV

Order II.—Chiroptera (Bats)

THE title of the order with which we are about to deal is composed of two Greek words, the former meaning a hand and the latter a wing ; and the Chiroptera are therefore 'hand-winged' animals. The early naturalists often experienced difficulty in classifying various animals, but none caused more controversy than these strange, weirdly-formed creatures. Because they could fly some assigned the Bats to a position among the birds, while others claimed that they were quadrupeds ; but modern investigations have proved them to be mammals, clearly separated from any other group of animals.

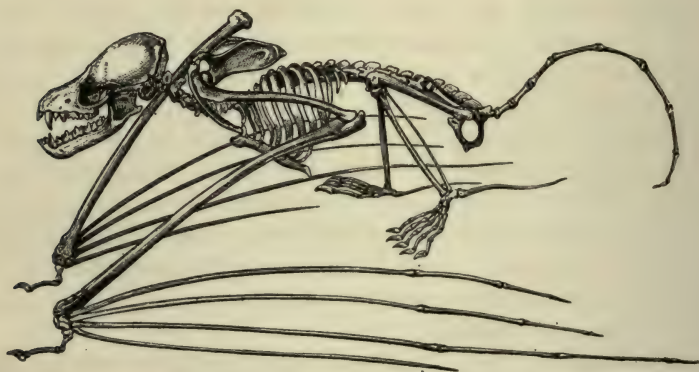
'Flittermouse' was a common old English synonym for the Bat, and the Icelanders gave it the very expressive title 'Leather-flapper.' Most Bats are very mouse-like in appearance.

Expressed in simple language, a Bat is a mammal provided with true wings, with which it is able not merely to propel itself through the air for a longer or a shorter distance, but to fly like a bird by beating the air with its anterior members. At the end of the Anthropeidea was described the Colugo, which in common with the Flying Squirrel and the Flying Phalanger has the skin of the flanks extended in a manner capable of sustaining the animals, very much in the manner of a parachute, in an extended leap through the air. But Bats possess the power of true flight : they move through the air with ease, and in pursuit of their insect-prey wheel and double and circle about

with a nimbleness that the human eye can only follow with difficulty.

The accompanying illustration of the skeleton of a Bat, together with the figures in Coloured Plate IV., showing open and closed wings, will assist to make plain the detailed description of the chief points of its structure.

Most of the Bats possess a full complement of teeth, the four canines being large and sharp; the incisors vary in number, and still more in their proximity to each other. Comparing the bones of a Bat's wing with the human hand and arm, we are at once struck by their exaggerated length for an animal that is often only one and a half inches long,



SKELETON OF THE MOUSE-COLOURED BAT.

and only in a few species exceeds in size a full-grown rat. The most elongated bones are those of the hand, a feature which is far more marked than in the case of the fingers. The fingers cannot be closed for grasping, and except the action of beating they are capable of movement only to open the wing, or to fold it up against the side of the body.

Being a flying mammal, the body must necessarily be designed for lightness, and to this end the bones are not filled with marrow, but with air. The ribs are flattened. There is considerable solidity in the shoulder girdle, where the greatest strength is required, and here are attached the great muscles which operate the wings. The thorax is

rather capacious, to allow room for the large heart and lungs; and the sternum, or breast-bone, is keeled like that of a bird to supply more surface for the attachment of still further wing muscles.

Upon this light and airy framework is stretched a flexible, leathery, nearly hairless membrane, which is really a continuation of the skin of the mouse-like body. Enveloping all the bones of the arms and hands, it extends to the hind legs, and in some cases includes the tail, being further supported by attachment to the heels. It is by means of this rudder-like tail, similar to that of a bird, that the Bat is able to make its rapid evolutions.

There are two groups of Bats; the insectivorous includes all those of Europe and most of those of America, as well as portions of Asia and Africa; the frugivorous are chiefly found in the South-east of Asia. The tail of the animal differs according to the group. Fruit-eating Bats have no need for the particularly rapid movements so desirable in the chase of insects upon the wing, and consequently they usually possess no tail membrane, which in Bats generally is long or short or absent altogether, according to the habits. Where the tail ends in a hard tip it bears more than a slight analogy to the prehensile tail of a monkey, and renders some assistance in terrestrial locomotion.

The short thumb is never inclosed in the wing membrane and renders no aid in flight, but is furnished with a strong curved claw, by means of which the Bat can suspend itself head downwards when it wishes to rest.

The hind limbs terminate in perfectly formed feet, similar to those of ordinary small quadrupeds, which with the thumbs of the anterior limbs, and in some cases the hard-tipped tail, are used in creeping and climbing. The Bat cannot walk along the ground with facility, awkwardly jerking forward first one side of the body and then the other; but it can run with considerable celerity. It is a common but quite erroneous notion that Bats cannot easily rise from the ground, but must throw themselves into the air from an elevation. Most species can swim if necessity compel them, but they have no liking for water.

Another common error is expressed in the simile 'as

blind as a Bat,' for all species possess very efficient eyes, though they are small and almost hidden in the soft fur. For the size of the animal the mouth is rather large, with a full complement of sharp teeth. In all cases the ears are large, but in some Bats they develop into an expansive membrane that can be folded up very much in the same manner as the wings. Not a few species have remarkable membranous appendages on the nose, sometimes quite complex in construction, giving the Bat an extraordinary appearance. It is supposed that the ear and nose organs are of more utility than merely to catch sound and to smell, and that they are intimately related to the animal's remarkable sense of touch, which is carried to a degree of delicacy quite unknown in other creatures. The ear and nose and wing membranes are little less than a mass of blood-vessels and the finest nerves, affording a sensitive surface that assists the Bat to perceive the nearness of objects.

It is well known that the Bat can perform the most rapid and baffling movements in the dark among buildings and trees, even going to the length of wheeling and doubling through the branches. Spallanzini, about the year 1775, tested the extreme sensitiveness of the exposed membranes and their ability to sense objects without utilising sight or actual contact. He sealed up the Bats' eyes, temporarily blinding them, and then set them free in a chamber in which were suspended dangling strings and cloths perforated with holes large enough to permit a Bat to pass through. In their flight they avoided all these obstacles, passing through the holes, turning corners, and finding crannies for concealment or escape. They gave abundant proof that the eyes render quite unimportant assistance in the creature's nocturnal evolutions. The closing of the ears seemed to be felt more than the loss of sight, though it never amounted to embarrassment. Altogether the experiments practically proved that the Bat is possessed of powers that almost, if not quite, amount to a sixth sense.

Bats are distributed over nearly all the world, being completely absent only in the coldest regions. They are most numerous and attain their greatest size in the Eastern tropics. A few species live chiefly in pairs, but more

often they are gregarious, living in enormous companies, rivalled in point of numbers only by the great flocks of sea-birds which resort to certain localities in the nesting season.

They generally spend the day in sleep, hanging head downwards by the claws of their hind feet in caves, hollows of trees, and, in fact, any dark recess; in Temperate regions they are especially fond of taking cover under roofs or in the corners and crevices of deserted and ruined buildings. Nocturnal in habit, they seldom emerge from their hiding-places until at least twilight, although the rule is not without exception. On the approach of cold weather the creatures hibernate in some place likely to allow them to remain safe from molestation. It is stated that some of the Canadian Bats migrate southwards to avoid the long and severe winters.

There are over a hundred and thirty known species of Bat; probably there are many more, but their main characteristics are so similar that a description of a few of the best known will serve for the whole. In the British Isles there are more than a dozen species, all of which are among the smallest of their kind, and all are insectivorous.

LONG-EARED BAT (*Plecótus auritus*).

Coloured Plate IV. Fig. 3.

The Long-eared Bat, whose generic and specific names signify folded ears and long-ears respectively, is an excellent example, though not the commonest, of our British Bats. It is found in Europe, North Africa, and in Central and Western Asia. Even including the tail it is only about four inches in length, with a wing spread of thirteen or fourteen inches. It is the most pleasing of our native Bats owing to the transparency and beauty of its ears, which in proportion to the size of the head are exceptionally large (Plate VII. Fig. 3). They are exceedingly mobile, moving backwards and forwards as the animal listens intently to any sound, or they gracefully fold up when their owner wishes to sleep. The ears are peculiar in that they possess a tragus, or inner lobe. It really looks as if the animal has

four ears, two large and two small, and when the Bat is asleep and the ears are folded, only the tragus is visible, giving the Bat an altogether different appearance to that which is presented when it is awake. When on the wing most insectivorous Bats give vent to short sharp squeaks, and the voice of the Long-Eared Bat is particularly shrill and high-pitched.

All British Bats feed wholly on flies and other winged insects, gnats and midges in particular being consumed in great quantities nightly. If a Long-eared Bat be kept in captivity it will eat thirty or forty bluebottles in the course of the day, and its appetite is so enormous that no matter what number of flies are placed within its reach at night they will all have disappeared by morning.

Living exclusively upon insects, with the approach of winter the Bat finds its supplies of food almost, if not quite entirely, cut off. When various insect-eating birds are faced by the same problem, they solve it by migrating to warmer climates where insects abound all the year round. But the Channel debars the Bat travelling further southwards, causing it to take advantage of a peculiar faculty called hibernation. The Bat retires to some dark retreat where quiet and some degree of warmth are attainable ; and there it sinks into a condition that appears to be intermediate between sleep and death, in which the circulation is exceedingly languid, not more than one heart beat per second, and there is a total cessation of respiration and digestion. During a torpor that seldom lasts less than three months, and in some cases nearly twice as long, the creature would perish of starvation, but for a wise provision of Nature which insures that just before it retires the Bat becomes very fat, of which there is sufficient to make good the loss of tissue that even the very slow circulation necessarily entails.

British Bats in particular are useful as one of Nature's checks, reducing the numbers of the insect world in the air just as the Insectivora do upon the earth. Their odour is always more or less disagreeable, and their flesh is of no utility for food. Stoats and owls catch and feed upon the creatures, but a dog will rarely take one up in its mouth.

PIPISTRELLE BAT (*Vesperugo pipistrellus*).

Coloured Plate IV. Fig. 2.

The Pipistrelle Bat is by far the commonest in the British Isles, being more frequently in evidence, if only because it hibernates for only three months of the year. It is also less strictly nocturnal in its habits than some of its kind, for it may sometimes be seen indulging in a few fly-catching flights in the middle of the day during brilliant sunlight. It is not a rarity, though unusual, for it to appear at mid-day even in winter, urged probably by hunger to hunt for what must assuredly prove a very scanty meal.

The Pipistrelle is perhaps more like a mouse than almost any other species. In size it is about the equal of the tiny quadruped, and its body is covered with fur similar in texture and in colour, with the addition of a tinge of red. Its ears almost exactly resemble those of a mouse.

Other British Bats are less known except in the localities they frequent. The Barbastelle Bat (*Synotis barbastellus*), Plate VI. Fig. 2, is very largely restricted to the South-eastern counties. It differs prominently from some of the tribe in the possession of tufts of black bristles—whiskers on the cheeks of its black face. The Whiskered Bat (*Vespertilio mystacinus*), met with in Hampshire and adjacent counties, has its face thickly overgrown with fur. Reference has been made to the membraneous expansion of the nose in some species. The Greater Horseshoe Bat (Plate VII. Fig. 2) and the Lesser Horseshoe Bat have a nose leaf in the form of a horseshoe, but otherwise their appearance and their general habits call for no further mention.

MOUSE-COLOURED BAT (*Vespertilio murinus*).

Coloured Plate IV. Fig. 4.

The Mouse-Coloured Bat is two inches in length, exclusive of the tail, and is the largest Bat in Central Europe. It is a short-eared species, which are far more

numerous than the long-eared ones. The particular species under notice is as rare in England as it is common on the Continent, where it frequents buildings, but not trees. In respect of hibernation it retires later and reappears earlier than its long-eared relatives. Its habitat is not confined to Europe, but includes North Africa and extends into Central Asia as far as the Himalayas.

THE FRUIT BATS.

The genus *Pteropus* (winged-foot) includes the largest of the Chiroptera, of which the chief are two well-known species: the Collared Fruit Bat (*Pteropus collaris*) and the Kalong (*Pteropus edulis*), Plate VI. Fig. 1. Throughout the East they are often called Flying Foxes by the European residents.

The Kalong of Java—and the name is popularly applied indiscriminately to various species—in its maturity attains a size equal to that of a rook. A long pointed muzzle gives the head very much the appearance of a dog or a fox; and the resemblance is increased by the rather full eyes, markedly cunning in expression (Plate VII. Fig. 4). The animal possesses no tail, and the second finger is usually provided with a claw. Its wings when spread are nearly five feet from tip to tip; and notwithstanding its size the creature flaps through the air without the least audible noise. It is a wise arrangement of the Creator that gives muffled wings to all night-flying creatures, whether birds, moths, or bats.

Fruit Bats form immense colonies that work much damage to soft-fruit plantations, such as bananas, figs, &c. The Kalong in captivity will eat apples, pears, mice, blackbeetles, and bits of raw meat. In the jungle it adds lizards and small birds to its fruit menu. But there is some compensation to the planters in the fact that these frugivorous Bats are themselves tolerably good to eat.

Unlike most other species, the Fruit Bats are not incommoded by light; instead of seeking dark recesses they suspend themselves from the tops of tall trees. When sleeping they hang by one foot, tucking the other foot and



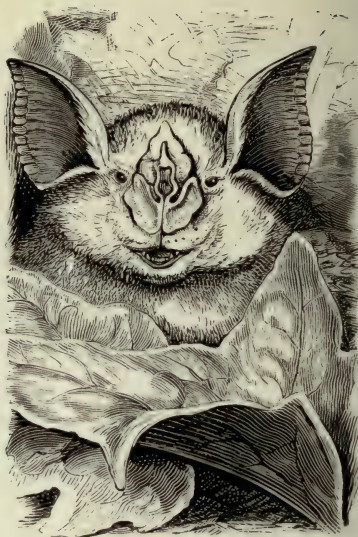
1. KALONG.

2. BARBASTELLE BAT WALKING.

(See page 85)



I



2



3



4

HEADS OF: 1. VAMPIRE BAT. 2. GREATER HORSESHOE BAT.
3. LONG-EARED BAT. 4. KALONG (*Natural size*).

leg under the wing. The goose sleeps upon one leg lest upon some frosty night it may get frozen hard and fast to the ice. But why these great bats hang by one leg nobody appears able to explain.

VAMPIRE BAT (*Phyllostoma spectrum*).

Coloured Plate IV. Fig. 1.

The ancients in their highly imaginative mythology made use of fabulous creatures, partaking of the nature of beast and bird. The three Harpies, the daughters of Neptune and Terra, each possessed the face of a woman, the body of a vulture, and fingers armed with sharp claws. They emitted an offensive smell and spoilt whatever they touched by their filth ; and Virgil relates how these fearsome creatures appeared to affright the guests from a great feast.

It is not at all improbable that the large fruit-eating Bats gave rise to some of these objects of superstitious dread ; for as they silently flit about they are indeed suggestive of everything that is hideous, foul, and evil. There was also an ancient belief in vampires, nocturnal demons that were supposed to eat out the hearts and souls and suck the blood of their victims. Although it could not possibly have been known to the ancients, there is a blood-sucking bat in South America. It belongs to the genus *Phyllostoma* (Leaf-mouth) or Spectre Bats, and with a wing-spread of two and a half feet is one of the largest of the family.

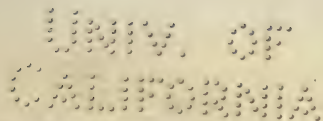
The Vampire Bat possesses a cloven leaf-shaped nose membrane, but is without a tail. There appears to be little doubt that in the main it is a fruit eater ; but it is equally certain that there are closely allied genera that are in the habit of sucking blood from the bodies of the larger mammals, not excluding man, while the victim is asleep. The Vampire's teeth (Plate VII. Fig. 1) are in strict keeping with such a propensity, consisting of two projecting incisors with lancet-shaped canines, all terminating in sharp points, and so placed as to make a triple puncture like the bite of a leech. In some regions it is dangerous to sleep uncovered. A traveller, speaking from experience, says the animal will

attack any person who is in a sound slumber, biting a piece out of the great toe no larger than a pinhead. The wound is not sufficiently painful to awaken the sleeper, and through the tiny orifice the bat will continue to suck blood until it is scarcely able to fly. Domestic animals in some parts of South America are specially liable to attack, and for that reason the rearing of calves in particular is a difficult matter. Horses are often bitten on the withers, and if an animal does not suffer much from loss of blood, the pressure of a saddle upon the wound will cause troublesome inflammation. It must be admitted that there are few reliable accounts of a Bat having been caught while in the act of bloodsucking.

The Chiroptera render man good service in their constant war upon the insect world, and a few species are utilised as food ; but where Bats exist in very great numbers they are sometimes a source of considerable wealth. Guano, the decomposed or fossilised excrement of sea-birds, is found largely on certain islands along the Pacific coast of South America. Sometimes the beds are from fifty to sixty feet in thickness, and as a fertiliser the material is of such commercial value that Chili and Peru in 1881 went to war concerning the possession of some of the guano islands.

The guano of Bats has been found in large quantities in caverns in France, Italy, and the Pyrenees ; but probably the largest guano caves are those of San Antonio in Texas. By means of a shaft entrance to the cave the guano can be dug out without disturbing the sleeping bats, the number of which in the largest cave is enormous. When evening comes it is a wonderful sight to see them issue forth from the mouth of the cave in a dark stream like a moving cloud for quite two hours, with a noise of whirring wings which sounds like a gale of wind. The sight is wonderfully interesting, but the stench from the creatures is almost unbearable. The supply of guano is naturally not inexhaustible. When the guano has been taken from a cave it is closed for a period of four years, by which time there is another deposit well worth removal.

Plate IV.



1. Vampire Bat



2. Pipistrelle



3. Long-eared Bat.



4. Mouse-coloured Bat



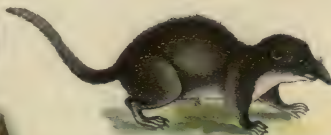
5. Mole



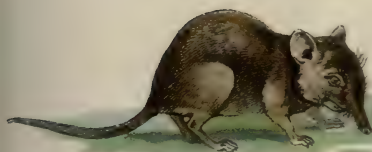
6. Tanrec



7. Water-Shrew.



8. Elephant Shrew



9. Hedgehog



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Chapter V

ORDER III.—INSECTIVORA (INSECT- EATERS)

General description of the Insectivora—
Hedgehog—Mole—Common Shrew—Pigmy
Shrew—Water Shrew—Elephant Shrew—
Tanrec—Tana or Tree Shrew—Potamogale.

CHAPTER V

Order III.—Insectivora (Insect-Eaters)

THE animals comprised in the Insectivora are, as the name implies, insect-eaters. Their distinguishing characteristic is the teeth, generally no less than forty-four in number, and among which there are none with flattened surfaces. Even the molars are dotted with conical points, which are admirably adapted to crushing the hard outer coverings of some of the insects upon which they feed. Some members of the order, however, have departed largely from the insect diet, in one case changing it largely for fish and in another for worms; while some of them are quite omnivorous.

The Insectivores have short legs fitted with five toes each, and in running they place the entire sole on the ground. They are usually terrestrial, a few only are tree-climbers. Most of them are nocturnal and largely lead a subterranean life; during the winter in cold countries they enter into a more or less torpid state.

The Insectivora are divided into at least nine families, three of which, the Hedgehog, Mole, and Shrews, are well represented in our own country.

FAMILY ERINACEIDÆ

HEDGEHOG (*Erinaceus europæus*).

Coloured Plate IV. Fig. 9.

The Hedgehog is a native of most parts of Europe, the temperate parts of Asia from the Urals to the Pacific,

and Asia Minor and Syria. In our own country it is often called the Urchin, Furze-pig, and Hedge-pig. In appearance it is very distinctive, having its body covered with prickly spines instead of hair. The spines are really set in ball-and-socket joints, causing them to be very elastic, so that even a blow or a fall from a great height will not drive them into the animal's own body.

The Hedgehog is about ten inches in length without its tail of another inch. Its limbs are short, but it can run swiftly. It has a long snout with a loose flap bordering each of the nostrils, which are of good service when the



SKELETON OF THE HEDGEHOG.

creature is grubbing. The face is covered with strong, coarse hair, out of which peer bright, clear eyes of bluish grey. In its very full comple-

ment of teeth there are three pairs of incisors in the upper jaw, the inner pair of which are long and tusk-like. Considering its size, the jaws and teeth of the Hedgehog are very powerful; it can splinter the bone of a mutton chop with comparative ease.

No part of the anatomy of the Hedgehog is more interesting than the powerful muscle of the back, lying under the skin, and scientifically termed the *panniculus carnosus*, i.e., the 'fleshy rag.' This is the muscle which enables a dog to shake itself dry when it leaves the water. The roots of the bristles pass through the skin sufficiently far to connect them with the muscle, and when it is contracted the bristles are erected. The same muscle enables the animal to roll itself into a ball when alarmed, and to retain that position so firmly that it cannot be drawn straight by force alone. With the tender under parts thus protected, there is presented to its enemies what amounts to a terrible coat of mail.

The Hedgehog is not limited to insect food. It preys on

reptiles, small quadrupeds, and even feathered creatures when it can catch them. Fallen nuts and soft fruits are readily eaten ; while in captivity it will not refuse soaked bread, cooked vegetables, and flesh, raw or roasted.

Though fond of eggs and milk, there is no truth in the quite common belief that the Hedgehog helps itself to the warm fluid direct from the teats of cows lying in the fields. Equally fanciful is the statement that the animal climbs trees, returning to the ground with its spoils impaled upon the points of its spines. If in its nocturnal rambles it should come across eggs in a ground nest, the Hedgehog will make short work of them. Grasping an egg between its forefeet, the animal makes a hole in the end of it just big enough to permit the insertion of its tongue, and the contents will be licked out without the slightest waste.

The manner in which the Hedgehog attacks a viper is as interesting as it is effective. Creeping quietly up to the reptile, it seizes it by the tail with its teeth, and in a flash rolls itself up into a ball. Lashing itself into a fury, the viper makes terrific darts at its enemy, who simply holds on to the tail, allowing the reptile to cut its head almost to pieces against the remorseless spikes. When at length the viper is overcome, the victor passes it gradually through its jaws, cracking the bones till it is quite limp, and then, commencing at the tail, proceeds to devour it.

The Hedgehog has few natural enemies ; a dog, for example, will think twice before testing the quality of the spines after it has had one painful experience. The stoat and the fox overcome it ; the latter, it is said, rolls the prickly ball into water, which causes the Hedgehog to relax its muscles to escape from drowning ; and that action is the opportunity for which the artful fox is in readiness.

It is an interesting fact that the Hedgehog pairs for life. A nest of dead leaves and moss is made in a thicket, the leaves woven into a thatch to keep out the spring showers. The young ones, usually three or four in number, are not only born blind, as is the case with many animals, but their ears are closed, which is very unusual. The quills are white and flexible, leading one almost to doubt whether the little creatures are not young birds.

No British mammal hibernates more thoroughly than the Hedgehog ; and it provides not the slightest store upon which to dine during any unexpected period of wakefulness. That the creature is occasionally seen abroad in the winter months is no argument against its hibernation. Indeed, it is a fact that extreme cold frequently arouses hibernating animals from their torpidity ; and, once roused from any cause, it is quite likely that the hungry Hedgehog will search about for food to make a scanty meal before resuming its interrupted slumber.

If we forgive it a few pheasant and partridge eggs, the Hedgehog may be regarded as a useful animal ; and it is often utilised to clear houses of various noxious beetles. The animal is but little used for food. Gipsies are said to be rather fond of it, enveloping it in well-kneaded clay and then thrusting it into the heart of a fire. When the cooking is complete the skin and prickles come away with the clay.

FAMILY TALPIDÆ.

MOLE (*Talpa europæus*).

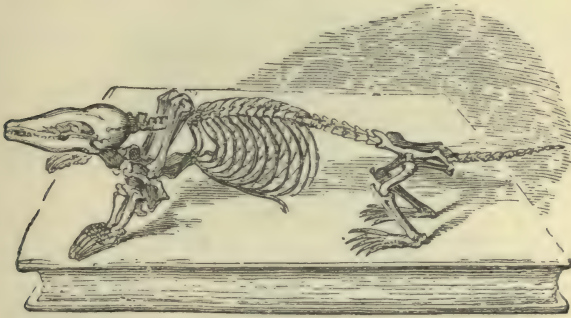
Coloured Plate IV. Fig. 5.

The common Mole is the best example of the family Talpidæ, all of which chiefly live underground. It is general over all Central Europe and Asia, well known in England and Scotland, but is totally absent from Ireland. A consideration of its build will show how perfectly the creature is adapted to its mode of life below the surface of the ground. Seldom exceeding eight inches in length, including the tail, the body is cylindrical in form. The head is large ; the snout is slender, strong, and sinewy ; and there is an absence of neck, which would be a weakness in the animal, just as it would be in the case of a boring tool.

The fore legs, terminating in five long and strong claws, are short ; while the feet are broad and spadelike, and, considering their size, are extremely strong. They are turned outwards, with back-turned claws, to enable the

animal not only to dig, but to throw the soil behind it, which it does with incredible speed. When it commences to burrow, the Mole seems literally to sink into the ground. The hinder limbs do not possess the strength of the forefeet, and are used only for progression.

In the Mole it is the canine teeth that are most prominent, instead of the incisors, as in the hedgehog. It is a very popular belief that it possesses no eyes. Examination shows that this is a mistake; but the eyes are exceedingly small, and retracted beneath the fur, well out of danger from particles of earth as it is flung up by the forepaws. Though it has no external ears, which would be in the way,



SKELETON OF THE MOLE.

its internal ones are particularly acute, and its taste and smell are similarly well developed.

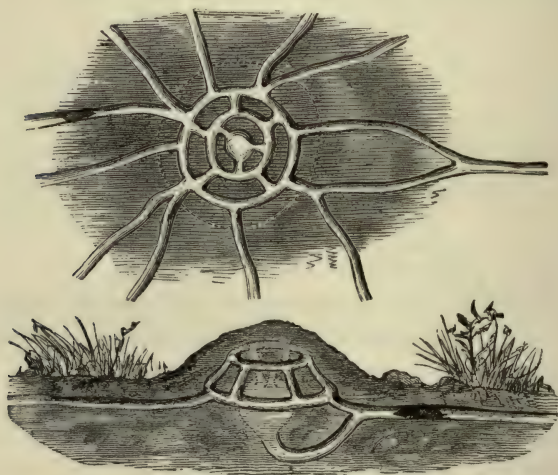
The skin is extremely tough, upon which the short hairs grow perpendicularly, forming a close-set, velvety fur, absolutely smooth, whichever way it is stroked or brushed. This peculiarity provides that in moving backwards or forwards in the underground galleries the coat remains perfectly clean and free from soil. Though usually black in colour, there are exceptions; sometimes the fur is yellowish white or grey, and more rarely it is all white.

The home of the Mole is constructed with infinite care and skill. The accompanying illustration shows a hillock of earth, supported by partitions or pillars at regular distances. In this are two circular galleries, one above the other, with five connecting passages. The central chamber

leads to the upper gallery by three passages, while there are three times as many runs in different directions from the lower one.

The hillock is beaten and pressed until it is hard enough to withstand the penetration of water. Under the central arch is a small mound which is pierced with sloping holes, the entrances to hard and firm paths, twelve to fifteen paces in length, which radiate from it like the spokes of a wheel from the hub. Altogether it is a perfect maze, well calculated to defy pursuit even by the weasel.

Moles live in pairs, breeding in spring and sometimes in



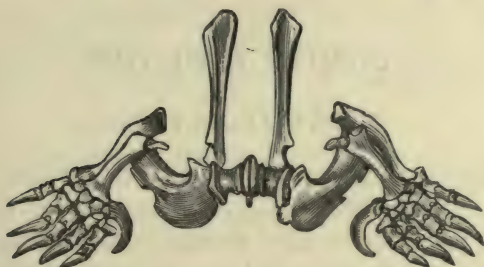
THE MOLE'S FORTRESS (HORIZONTAL AND VERTICAL SECTIONS).

autumn, the family of young numbering five or six. The female makes a nest of dried leaves in the upper gallery, or else constructs a fortress of her own. There are always fierce fights among the males when they are selecting their partners.

No animal works so hard for its daily food as the Mole. Its whole existence is spent in constantly raising and removing large quantities of earth by sheer force of muscle. Its appetite is voracious; it works like a horse, and eats like an elephant in proportion to its size. In all its waking moments it is digging and delving and scurrying after

worms in all its galleries and tunnels. Its digestive powers are remarkably rapid, and with heart and lungs and muscles working at a furious rate, about twelve hours is the limit that it can exist without food. The Mole lives chiefly upon earthworms, which it dexterously skins, stripping off the skin from end to end, and pressing out the contents of the body. But the energetic digger does not limit itself to a diet of worms ; it preys upon frogs, small quadrupeds, and birds, first tearing open the body in its softer parts and gorging itself with the blood. Unless there be plenty of food available the Mole does not hesitate at cannibalism, the strong inevitably devouring their weaker brethren under pressure of hunger.

The Mole is not popular with gardeners and farmers,



FORE LIMBS OF THE COMMON MOLE.

who view its nocturnal burrowings in cultivated land with marked disfavour. It is annoying to find prized plants uprooted or greensward rendered unsightly by the numerous upheavals that mark the creature's tremendous energy. Nevertheless the Mole lays down a system of subsoil drainage without costing the farmer a penny. It is an interesting historical fact that the Jacobites toasted the Mole because William of Orange broke his collar-bone in a fall over a mole-hill.

An acute observer says that he has traced a fresh tunnel nearly a hundred yards in length that has been burrowed in a single night. What this furious footwork really means will be best understood by the calculation that if a man were to do similar work in proportion to his size, then in one

night he would have to excavate a tunnel thirty-seven miles long and of a size to allow him to crawl through it.

Thoughtless people are apt to pity the Mole for its dark and apparently cheerless life ; but the reader, seeing what infinite pains the Creator has taken to adapt every little detail of its structure to its life, will be able to understand that the Mole is as happy while burrowing in the dark underground as is the skylark floating high up in the sunshine and pouring out its joy in exulting song.

There is a demand for the fur of the Mole, which is the finest of any British animal. It is very impervious to wet, and many thousands of skins are used every year for jackets, waistcoats, purses, &c. One of the most durable of textiles, a strong fustian that wears like leather, has received the name 'moleskin.'

FAMILY SORICIDÆ.

SHREW (*Sorex vulgaris*).

The Shrews, of which there are three varieties in our country, are commonly called Shrew-mice ; but though in general appearance they resemble mice, their teeth indubitably prove them to belong to the Insectivora.

The common Shrew is usually about two inches and three-quarters in length, of which quite half is accounted for by the tail. The attenuated snout is the chief feature of the head. The body and the tail are covered with fine velvety fur, reddish mouse-colour above and grey beneath. The creature is common nearly everywhere in the British Isles, except Ireland. It abounds in dry fields, hedgerows, and gardens. Grubbing with its long snout for worms and insects, it makes long runs just under the surface of the ground. Insects are preferred to anything else, but the little creature will attack lizards and frogs and even very small birds. In spring there are fierce fights among the males for mates. The nest of leaves and dry grass is made in a hole in a bank, in which from five to eight young ones are born in July or August.

During the autumn large numbers of dead Shrews are

found along the hedgerows and in ditches, without any evident cause of death. There is no apparent external injury, and certainly they have not met their end by weasels, hawks, or owls, or other of their natural enemies, or they would have devoured them. It has been suggested that with the autumn there comes a lack of food owing to the decreasing insect life, and that is the best explanation that can be given, and only surmise at that.

The Pigmy Shrew (*Sorex minutus*), an inch shorter than the foregoing, is the smallest of our British mammals.

It was a common superstition in olden times that the merest contact with a Shrew inflicted injury upon cattle. In some villages a pollard ash-tree was selected to form the 'Shrew Ash.' A hole was bored in the trunk, a poor little Shrew was inclosed in it alive, and then the hole was plugged up. It was believed that the twigs and branches of the tree possessed curative qualities when applied to animals suffering from the touch of the Shrew.

WATER SHREW (*Sorex fodiens*).

Coloured Plate IV. Fig. 7.

Slightly larger than the common species, the Water Shrew is chiefly blackish-brown in colour; the feet and under-surface of the tail are fringed with long white hairs. It burrows into the banks of streams and is very aquatic in its habits. It possesses valved ears, which automatically close immediately the Shrew enters water.

It is interesting to watch the little creature dive into clear water, at the bottom of which it is able to remain a long time. On land the weasel preys upon it; in the water the voracious pike views it as a tasty morsel.

'Its swimming,' says Mr. Bell, 'is principally effected by the alternate action of its hinder feet, which produces an unequal or wriggling motion; it makes its way, however, with great velocity. With its belly flattened, the sides, as it were, spread out, and the tail extended backwards as a rudder, it forms a very beautiful and pleasing object, moving on the calm surface of a quiet brook or diving,

in an instant, after its food, its black velvety coat becoming beautifully silvered with the innumerable bubbles of air that cover it when submerged; and on rising again the fur is observed to be perfectly dry, repelling the water as completely as the feathers of a water-fowl.'

FAMILY MACROSCELIDIDÆ.

ELEPHANT SHREW (*Macroscelides typicus*).

Coloured Plate IV. Fig. 8.



SOLE OF
HIND FOOT
OF
ELEPHANT
SHREW.

(Natural size.)

The Elephant Shrew is a curious mouse-like little creature that takes its name from the elephantine elongation of its nose. The whole length of the animal is five inches. The generic name means 'long-legged,' the hind legs being longer than the fore limbs; and the animal moves in a succession of leaps in biped fashion.

There are several species of the Jumping Shrews, as they are often called. Nearly all of them exist in South Africa, where they burrow in the ground, flying to their retreats the instant they are disturbed. They are insect-eaters, picking up a living amid the scanty herbage that grows in the rocky regions where they make their homes.

FAMILY CENTETIDÆ.

TANREC (*Centetes ecaudatus*).

Coloured Plate IV. Fig. 6.

The animals of this family are cousins to the hedgehog, for their coat is softly haired, but mixed with bristles and flexible spines, which are strongest about the neck. The Tanrec is not only the best known of the family, but is the largest of the Insectivores. It is fifteen or sixteen inches in length; it has no tail. Because of various technical resemblances it is certain that the Tanrec is, of all living

mammals, the most nearly related to the Marsupials of Australia and America.

The animal is very prolific; usually fifteen or sixteen young ones at a birth, sometimes, indeed, as many as twenty-one. Madagascar is the headquarters of the Tanrec, but it is also now found in Mauritius and Réunion. For six months in the year—June to December—it goes to sleep in a hole which it has dug for the purpose. When it retires it is very fat, which is just the time that the natives set out to hunt for what they regard as a great delicacy. Opinions differ concerning the flesh, for while some people compare it to sucking-pig, others complain of its musky flavour.

Owing to its strictly nocturnal habits the Tanrec is not an animal that easily lends itself to observation. Insects and worms are the staple items in its diet, to which it adds roots and fruits.

The Tendrac (*Ericulus spinosus*), another member of the family, is often confounded with the last-named animal, whereas it is a much smaller creature than our common hedgehog, which it closely resembles in appearance.

FAMILY TUPAIIDÆ.

TANA (*Tupaia tana*).

Coloured Plate XIV. Fig. 5.

This animal, which at one time was confounded with the Squirrels and the Lemurs, is purposely figured with the Rodents to allow of easy comparison with the squirrel. The generic name was derived by Sir Stamford Raffles, who first discovered the creature, from the Malay name for squirrel. There are more than a dozen species of the Tupaias or Tree Shrews, which are widely distributed between India and the Philippines. The family belongs to the group of animals more commonly known as the Bangsrings. Though the Tana is one of the larger species, its body is only eight or nine inches in length and covered with rather long, soft, glistening, reddish-brown hair. The tail is long and bushy, and the hair is arranged very much in two rows, something like the feathers of an arrow-shaft. The animal greatly resembles the squirrel, not only in appearance, but also in

its sprightliness and activity. The whole of the family chiefly inhabit trees, and they feed on fruits and insects.

The animal figured on the plate is the Bornean Tree Shrew. In eating its food it will hold it in its fore paws exactly like a squirrel. It obtains insects usually from trees, but sometimes is seen on the ground searching for food, very much in the same manner as the common Shrews. The Madras Tree Shrew (*Tupaia ellioti*), which is abundant in Peninsular India, at certain periods of the year is found dead in considerable numbers, which recalls to mind the strange fate that befalls the English Shrew referred to earlier in the chapter.

FAMILY POTAMOGALIDÆ.

POTAMOGALE (*Potamogale velox*).

The Potamogale, or West African River Shrew, is supposed to be nearly related to the Tanrecs, but has so few points in common with other Insectivores, that it has to form a distinct family in itself. It is about ten or eleven inches in length from the tip of its broad and bristled muzzle to the root of its tail, which is long and very compressed, except where it almost imperceptibly joins the body. The lithe, otter-like form, valved nostrils, and the fine soft fur with an outer covering of long hairs, in themselves are sufficient to suggest aquatic habits. The toes are not webbed, but the tail appears likely to provide excellent motive power.

The Potamogale was discovered in West Africa by Du Chaillu, who says : 'It is found along the watercourses of limpid and clear streams, where fish are abundant. It hides under rocks along these streams, lying in wait for fish. It swims through the water with a rapidity which astonished me; before the fish has time to move it is caught. On account of the rapidity of its movements, I have given it the specific name of *velox*. The animal returns to land with its prey almost as rapidly as it started from its place of concealment.'

Chapter VI

ORDER IV.—CARNIVORA (FLESH-EATERS)

SUB-ORDER I.—CARNIVORA OF THE LAND

General description of the Carnivora—Family
Felidæ : Lion — Tiger — Leopard — Ounce —
Jaguar—Puma—Ocelot—Fishing Cat—Serval
—Wild Cat—Domestic Cat—Lynx—Caracal
—Cheetah—Hyænas—Aard Wolf—Family
Viverridæ : Civet—Ichneumon—Mongoose—
Genet—Parodoxure—Binturong—Suricate—
Family Canidæ : Domestic Dog—Eskimo Dog
—Pariah Dog—Red Dog of the Deccan—Cape
Hunting Dog—Dingo—Wolf—Coyote—Jackal
—Common Fox—Arctic Fox—Silver Fox—
Fennec—Family Mustelidæ : Weasel—Stoat
or Ermine—Polecat—Ferret—Mink—Marten
—Sable—Glutton—Badger—Cape Zorilla—
Skunk—Teledu—Common Otter—Sea Otter
—Family Procyonidæ : Raccoon—Coaiti—
Kinkajou—Cacomistle—Panda—Family Ur-
sidæ : Brown Bear—Grizzly Bear—Syrian
Bear—Polar Bear—Black Bear—Malayan Bear
—Spectacled Bear—Sloth Bear.

CHAPTER VI

Order IV.—Carnivora (Flesh-Eaters)

IN this order are many well-known species of animals which feed mainly, and in many cases exclusively, on flesh. The order is divided into two sub-orders:—

1. Fissipedia (Lat., *fissus*, to split ; *pes*, *pedis*, a foot), or split-footed animals, which form the Carnivora of the land.
2. Pinnipedia (Lat., *pinna*, a fin ; *pes*, *pedis*, a foot), or fin-footed animals, in which the toes are bound together by skin, thus forming fins or flippers. These animals, together with those of another separate order, form the Carnivora of the sea.

Sub-Order I.—CARNIVORA OF THE LAND.

The Carnivora of the land are the 'beasts of prey,' of which some species or other are found all over the world from the equator to the poles. Though the majority of them are flesh-eaters, many of them will partake freely of vegetable food from choice, and still more from necessity ; but some of the Bears, for example, are almost wholly vegetarians, just as some of the Lemurs, Insectivora, Rodents, and Marsupials, are comparatively large flesh-eaters.

The members of this sub-order, in the general neatness of their build and especially in the construction of their

teeth and claws, are particularly adapted for capturing and destroying living animals, and for tearing and devouring flesh.

Usually the teeth consist of twelve incisors with sharp cutting edges ; behind these on each side, top and bottom, is a strong, curved and pointed canine tooth. The premolars are pointed and much compressed, and the true molars are poorly developed, and in some cases absent altogether. There are really no chewing teeth, for the jaws only work vertically in shear-like fashion. The grip of the canine teeth is terrible, and the animal's prey cannot escape when once it is transfixed by what are little less than ivory skewers.

The feet are fitted with four or five digits, terminating in



LION'S CLAW—SHEATHED AND UNSHEATHED.

(Natural size.)

strong claws, none of which are ever opposable. Some animals, such as the lion, walk upon the toes, the underparts of which consist of soft, but tough, leathery pads, which enable the creatures to approach their prey the more stealthily and with an absence of noise. The bear, on the other hand, plants the sole of its foot flat upon the ground, with the consequence that there is less speed and springiness in its gait. Animals which walk like the lion are called Digitigrades (Lat., *digitus*, a finger), and those with the gait of the bear are called Plantigrades (Lat., *planta*, the sole of the foot ; *gradus*, a step).

The Carnivora at first glance appear to be of no use alive to man, and only for the sake of their skins when dead. There is, however, no waste in nature, and but for these agile, strong, and cunning destroyers, some of even the

gentle creatures of the animal world would increase to such an extent as to prove a positive scourge in the regions which they inhabit. Except for one family, the Carnivores of the land are terrestrial animals, but many of them are expert swimmers, and equally agile climbers.

Most of the Carnivora have the sense of smell most acutely developed ; their sight is keen, and their hearing remarkably delicate ; all of which are in perfect accord with their special construction to overcome the animals upon which they live.

The Cat, Dog, and the Bear are the most typical of the beasts of prey, and give their names to the three sections into which the land Carnivores may be divided. In this connection we have to bear in mind that such animals as the Civets and Ichneumons are included with the Cats ; the Wolf and Fox are allied to the Dog ; and the Bear section comprises not only the true Bears, but also the Raccoons and the whole of the Weasel tribe, Otters, &c.

FAMILY FELIDÆ (CATS).

The Cats are undoubtedly the best developed and the most beautiful members of the whole order of the Carnivora. As they are all constructed upon the same principles, our domestic pussy, which is the only one of the forty species entirely subjected to man, will well serve as a model by means of which to point out their chief characteristics. From the lion, which strikes down and carries off an ox, down to the frolicsome kitten pouncing upon its first mouse, all are flesh-eaters and destroyers of living animals. All of them have rounded heads and a special development of teeth and claws, together with muscles to control them. There are three incisor or cutting teeth in the front of each jaw, next to which are four powerful and sharply pointed canines, which are popularly called fangs. There are no true grinders, for even the ten premolars and the four molars have more or less sharp cutting edges and conical points. Consequently the Cats cannot masticate their food, but can only eat by snatch and swallow.

Their hind feet have the full complement of toes, *i.e.*,

five, while the fore feet appear to have only four toes. But a short examination of a Cat's foot will detect a sharp and curved claw about half way between the toes and the elbow. This 'dew-claw,' as it is popularly called, is in reality the nail of the thumb, the joints of which are only developed sufficiently to carry this claw, which is very useful when the prey is trying to escape. The Cats, therefore, really possess five toes on each foot.

The Cats, on account of their mode of life, must be swift of foot and capable of leaping great distances in order to capture their prey. The great length of the projecting heel-bones adds to the leaping power, not only affording attachment to enormously strong tendons, but giving an additional leverage to the limb. The bones of the fore limbs, too, are specially modified, the ulna being of great length and strength, and projecting far beyond the radius. There are practically no collar-bones, the only indications of them being two tiny, flattened, sabre-shaped bones, which even in the largest felines are only an inch or two in length.

The reason for this structure is very evident. The animal, when springing upon its prey, launches itself through the air, and simultaneously strikes with its fore-paws. If, therefore, the fore limbs were connected with the skeleton by a couple of strong collar-bones, those bones would be broken by the shock, as so often happens to ourselves, and the animal would be disabled. But, by their practical absence, the fore limbs are only indirectly connected with the skeleton, and so the required elasticity is obtained.

The nails, claws, or talons as they are indifferently termed, are strong, sharply pointed, and boldly curved so as to act like hooks. Now, however, comes a difficulty. The efficiency of the claws depends upon their sharpness, and if the animal were to walk upon them they would soon be worn down and blunted. Moreover, they would make a noise at each step, and so prevent the creature from stealing silently upon its prey. Therefore the under surface of the toes is furnished with a large and elastic pad, which gives the noiseless tread,

although it does not guard the tip of the claw from being blunted.

This latter object, however, is obtained by a piece of animal mechanism at once perfect and simple, which in the accompanying illustration is very clearly shown. In the lower figure may be seen two tendons, one passing under the toe, and, when contracted, drawing the claw downwards. The other, by its indiarubber-like elasticity, draws the claw upwards as long as it is not counteracted by the stronger tendon below. Therefore, when the animal is at rest, or simply walking, the claw is held off the ground; but when the lion or any other



THE MECHANISM OF A CAT'S RETRACTILE CLAW.

(Twice natural size.)

of the Cat tribe stretches out its paw to strike an enemy or its prey, the claw is drawn forwards from its sheath between the pads and is ready for action. This structure of the claws is termed 'retractile.'

A few more details of structure must be mentioned. Both the dog and the Cat are fond of licking the hands of those whom they love, and we all know by experience that the tongue of the dog is wet and smooth, while that of the Cat is dry and rough. The reason is that the tongue of the Cat has to perform an office which is not needed by the dog. The jaws and digestive organs of the latter are so constructed that the animal can break bones, if they be not very large,

swallow the pieces, and digest them. In fact, a dog requires occasional bones to keep it in good health ; but the Cat can neither crack bones nor digest them. Yet, when a Cat has torn the flesh from the bones there is still much meat adhering to them which cannot be removed by the teeth. Now the peculiar tongue comes into operation. Its upper surface is covered with a number of sharply-pointed projections, all directed backwards, and feeling like a soft rasp ; and with this apparatus is licked off every particle of flesh adhering to the bones.

The pupil of the Cat's eye is highly dilatable, closing to a narrow slit in broad light, but opening widely in the dark to admit all available light, so that the animal can see well in darkness. The long upper lip is fringed with stiff hairs or whiskers, the bases of which spring from very delicate nerves, enabling the domestic cat, for example, to gauge the size of a hole even when in complete darkness.

The range of the Cat tribe is wide, although it does not extend into the cold regions so far as the Dogs and the Bears. Carnivorous and sanguinary to the last degree, it is fortunate that Cats almost invariably hunt their prey alone ; if they possessed the instinct of sociality, a troop of lions or tigers hunting in concert would be an appalling scourge that man could not withstand.

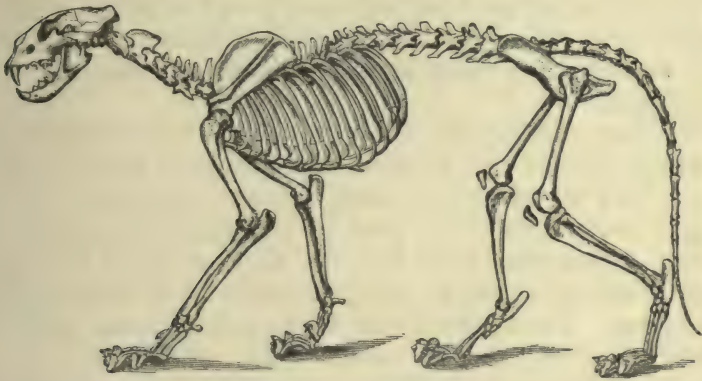
LION (*Felis leo*).

Coloured Plate V. Fig. 3.

The Lion is a typical Cat save for one feature ; the pupil of its eye does not narrow to a slit. It is the largest of the Felidæ, standing about three and a half feet high, six feet in length, and with a tufted tail about a yard long ; a female or Lioness is somewhat smaller, but large Lions, weighing as much as 500 lbs., occasionally exceed these dimensions. The coat varies from dull tawny to yellow or silvery grey, the ears and tuft at the end of the tail and the mane of the male being more or less black. The hair of the wild animal is shorter and closer than that of one in captivity.

The mane of the male gives 'the King of beasts' a very imposing appearance, but in a wild state few animals possess the luxuriant adornment that is quite commonly seen in menagerie-bred animals. On the other hand, the free animal is far more alert and active, and is particularly bigger and stronger in the hind quarters than the captive specimen. There is, too, a marked difference in the eye. That of the captive breed is brown, not unlike that of a dog, but in the wild creature it is yellow, scintillating with fire, and strikingly luminous even after death.

Though in different regions it may differ very considerably in size and coloration, there is really only one species



SKELETON OF THE LION.

(About one-eighteenth natural size.)

of Lion, whether in Africa or Asia. It was formerly thought that the black-maned and the yellow-maned animals were distinct species; but a Lioness in the same litter will often have black and yellow-maned cubs.

The Lion is essentially an African animal, although its range extends into parts of Asia, including Persia, India, and some portions of China. The Indian Lion at least is making rapid strides towards extinction. For a century and a half the country has been occupied largely by British troops and an ever-increasing number of Government officials and white traders. The sport-loving Briton has made relentless war upon the larger Carnivores, one cavalry

officer alone, early in the last century, bagging no fewer than eighty Lions within three years.

In Africa the Lion still ranges from Algeria to the Orange River. It largely ignores climatic conditions, frequenting coastlands, the hot sultry valleys, desert regions, as well as plateaus six thousand feet above the sea, where the winter nights are cold and frosty. Moffat in British Bechuanaland in one day saw nine troops of Lions, but naturally the animal is now scarce in the South, owing to the spread of civilisation and the diminution and retreat of the vast herds of antelopes. Nevertheless, within the last ten years a Lion has been killed not more than twelve miles from Johannesburg.

In 1890, when Mashonaland was opened up by the British South Africa Company, the Lions were remarkably daring and offensive, and many narrow escapes were recorded by the pioneers :—

‘One of our fellows spent a very pleasant Christmas evening. About two or three miles after he had left our camp with the mails, two Lions attacked the horses. One creature sprang upon the back of the horse he was riding ; he was leading the other with the mails strapped on it in sacks. He managed to swing himself out of the saddle into a tree. The Lions left the horses and came and walked about under the tree for seven hours, when one of our wagons came up and the beasts were frightened away. The horse he was riding went straight to the next post station, dreadfully torn ; and the one with the mails was brought in by natives three days afterwards.’

When the Uganda railway was under construction the Lions at times created quite a panic. Two ferocious animals stationed themselves on the Tsavo river, and in quite a short time they killed twenty-eight Indian coolies and a still larger number of native workmen. The work of the section was brought to a standstill until the ‘man-eaters’ were destroyed. At another point on the line, when a train was in a siding a Lion actually pulled a passenger out of a sleeping compartment and devoured him.

Yet most travellers and hunters agree that the Lion is not nearly so formidable an animal, at least in daytime, as is

generally thought. It seldom meddles with man voluntarily ; but when man intrudes himself into the Lion's domicile, it is no wonder that the animal should attack him. Indeed, the Amatonga tribe did their best to dissuade Baldwin from killing the Lion, because they looked upon it as affording a supply of food, killing more than it could eat, and leaving the rest for them. If a man should come unexpectedly upon a Lion, the animal will invariably slink off, unless it should be taken very much by surprise, in which case it would probably fly at the intruder in self-defence. Says Gordon Cumming :—

‘One day, while out elephant-hunting, accompanied by two hundred and fifty men, I was astonished suddenly to behold a majestic Lion, slowly and steadily advancing towards us. Lashing his tail from side to side and growling angrily, he displayed a show of ivory that caused the two hundred and fifty Bechuanas to take headlong flight. In the confusion of the moment, eight of my dogs were allowed to escape from their couples. These instantly faced the Lion, who now became solicitous for the safety of his little family, with which the Lioness was retreating in the background. Turning about, he followed her with a haughty and independent step, growling fiercely at the dogs which trotted along at either side of him.’

Had she been without her mate, the Lioness would probably have charged the enemy without consideration of consequences ; but the male is never to be feared as much as the female, especially when she has her young to guard. When she is alone, she is more likely to attack than her consort ; but even she will rather escape than fight.

Thanks to the many menageries up and down our country, and the ease with which the Lion is bred in captivity, there are few who have not heard the Lion's roar. But a Lion's roar in a menagerie is one thing, and a Lion's roar in the open country at night is another. ‘Frequently it is a low, deep moaning, repeated five or six times, ending in faintly audible sighs. At others, he startles the forest with solemn roars reiterated in quick succession, each increasing in loudness to the third or fourth, when his voice dies away in low, muffled sounds

resembling thunder.' Gordon Cumming adds that 'the grandeur of these nocturnal forest concerts is inconceivably striking, and pleasing to the hunter's ear.' A trooper in Mashonaland hearing the Lion's roar for the first time was impressed differently :—

'I have often heard that a Lion's roar is very terrible. It is ; and if you want thoroughly to appreciate it, you must be lying in the open with two of them at it less than twenty yards off, in the middle of the night. The noise is hard to describe, but it is most like about fifty cows bellowing all at once, and with a tremendous vibration in it, which goes through and through you.'

That Lions can be dangerous neighbours, carrying off



SKULL OF THE LION.
(About one-sixth natural size.)

much cattle and occasionally killing human beings, cannot be denied. Their strength is enormous, and a full-grown Lion can pull down any animal except the elephant and the rhinoceros. In Mashonaland a Lioness killed a hundred pigs in a single night. She had entered a range of pens, and after killing and eating

one animal found that she could not return owing to a closing door ; the result was that she wandered from pen to pen in her efforts to escape and put to death every animal that she encountered. The appetite of a hungry Lion is enormous. It gulps down huge quantities of meat, often a good-sized antelope at a meal.

'Man-eaters,' as they are called, are almost invariably the old and somewhat decrepit animals, too stiffened by age to catch the active antelope or master the powerful buffalo. Such Lions take to haunting the native villages in hope of picking up a stray ox or a child or aged people, unable to oppose them. There are, of course, exceptions to the general rule. A 'man-eater' that killed thirty-seven

people on the Majali river was found to be an animal in the prime of life. But the very existence of man-eaters is discreditable to the villagers, and is due either to their laziness or their superstition. No one ever heard of a man-eating Lion establishing itself near any town or village that was inhabited by Europeans, an elderly Lion having long learnt the lesson that the white man is an enemy whom it must avoid if it value its safety. In Algeria the Lion is held in absurd dread by the natives, whose cowardly behaviour taught it to consider itself invincible. Consequently they tamely submitted to the loss of hundreds of cattle annually, considering them as a sort of tax which they were bound to pay without demur. Since the French have occupied the country the Lion has had no such immunity, and has already retreated to the more inaccessible regions.

Closely connected with the Lion, and, in fact, all the beasts of prey, is the very important question of cruelty. Why should one set of animals be allowed to feed upon another set, tearing in pieces their prey while still living? In the first place, we ought not to make ourselves the standard by which to judge the economy of the animal world. Man looks forward to the future, and fears death in proportion to his mental cultivation. The pure savage has no fear of death, simply because he does not possess the power of realising the difference between life and death. So the lower animals live in unconscious enjoyment of life until the last moment. Again, we ought not to assume that all animals possess equal capacity for suffering pain. Even in human beings there is a great diversity in this respect, and the lower the nervous organisation, the less is the sense of pain.

In no case should man cause unnecessary suffering to the lower creation over whom he is placed as a master, and not a tyrant. It is necessary to exterminate beasts of prey, and creatures of all kinds are needed for the food of man; but their death should be effected with the greatest possible expedition and the minimum of pain. Our treatment of the domestic animals in particular is often marked by a thoughtless disregard for the feelings of those over whom we have dominion. As far as we possibly can we ought to

treat all animals as we would like to be treated ourselves, and :

‘Never to blend our pleasure or our pride
With sorrow of the meanest thing that feels.’

Dr. Livingstone has shown us, by his own experience, that the very shock of being seized by a carnivorous animal takes away the senses of pain and fear. ‘I saw the lion just in the act of springing upon me. Grunting horribly, close to my ear, he shook me as a terrier does a rat. The shock produced a stupor similar to that which seems to be felt by a mouse after the first shake of the cat. It caused a sort of dreaminess, in which there was no sense of pain or feeling of terror, though I was quite conscious of all that was happening. The shake annihilated fear, and allowed no sense of horror at looking round at the beast. This peculiar state is probably produced in all animals killed by the carnivora, and, if so, is a merciful provision by our benevolent Creator for lessening the pains of death.’

Although the Lion is less inclined for battle than for flight, the task of killing one is fraught with the greatest danger. Unless it be killed or entirely disabled at the first shot, the Lion at once turns on its foes, and, like a lightning flash, is among them, ‘a cataract of claws,’ as a spectator happily remarked. It is a remarkable trait in all the large carnivora, that if they receive a mortal wound, and do not see whence it was dealt, they quietly lie down and succumb. But, if they catch a glimpse of their enemy, they gather all their remaining strength, and compress into a few seconds the vengeance of a lifetime.

The Lion is mentioned in Scripture more frequently than any other beast, except the domesticated animals. When a Lion took a lamb from the flock, David ‘caught him by his beard, and smote him and slew him’ (1 Sam. xvii. 34-36). There is also recorded the feat of Benaiah, who ‘went down also and slew a Lion in the midst of a pit in time of snow.’ This was a particularly daring deed, to descend into the pitfall and slay the captive single-handed.

TO THE
MUSEUM OF
NATURAL HISTORY

Plate V.



1. Puma



2. Tiger



3. Lion

Pitfalls, as means of capturing Lions, are mentioned in Ezekiel and elsewhere. Spikes were driven into the pits upon which to impale the falling animal. Nets were used in another method ; and both pits and nets are still used by the natives of India.

The Lion lingered in Palestine until about the time of the Crusades ; it is still found in Mesopotamia, where it used to afford sport to the Kings of Nineveh. It has long been kept in confinement by various nations. The Romans used it for public combats in the arena, and to gratify a cruel taste in witnessing the destruction of criminals. The Easterns kept the animal chiefly for display, and because it was regarded as a symbol of royalty.

The skin of the Lion is practically of no commercial importance, and during any one year perhaps not more than a hundred skins come into the market. The flesh of the Cat tribe is but little used for food ; but Hottentots and certain Arab tribes never hesitate to partake of it. The idea that a person develops the characteristics of an animal which he eats is very common among many peoples ; and while Lion-flesh would be given especially to boys in order to make them strong and courageous, the flesh of pigs or tortoises would be avoided, lest the eater should, in consequence, get small eyes.

TIGER (*Felis tigris*).

Coloured Plate V. Fig. 2.

Far more agile and rapid, the Tiger is more dangerous than the lion. This animal is wholly confined to Asia, and is to India what the lion is to Africa. In size it is at least the equal, if not the superior, of the lion, whose huge mane often gives it the appearance of being bigger than it really is. Unfortunately, the Tiger still survives in great numbers ; it swarms in the Sunderbunds, the marshy cane-brakes of the delta of the Ganges, and in the Malay Peninsula generally. Bigger Tigers still are found in China and Siberia, where the coat of the animal

is quite woolly, to enable it to endure the cold. Mr. J. D. Cobbold shot one in Central Asia in a frozen snow-covered swamp, where the hunter was almost in danger of freezing to death.

The largest known Tiger skin came from north of the Himalaya ; it measured thirteen and a half feet from the nose to the tip of the tail. But practically our sole reliable knowledge of the Tiger is limited to the scourge of India, the largest known skin of which measured eleven and a half feet.

The markings of the Tiger's fur are very beautiful, a series of dark, transverse stripes being laid on a rich, ruddy yellow ground ; there are black rings on the tail. The skin of the Cat tribe is loose, but in the Tiger it is in folds almost to bagginess. In their gambols or in their conflicts among themselves, or with other animals, it is practically impossible for the foe to get a firm grip of them.

The countenance of the Tiger is a terrible study in blood thirsty characteristics. The massive jaws, the fierce, snarling lips disclosing the great yellow fangs, and the relentless, glaring eyes make up a whole that thrills one uncomfortably, even when it is viewed through the bars of a cage. To meet the Tiger in its matchless strength in its native haunts calls for courage in the highest degree. Even an experienced hunter like Mr. E. D. Cuming says : ' Speaking for myself, that green glare of a Tiger's eyes at close quarters in uncertain moonlight has a distinctly unsettling effect on the nerves : one can hold steadier when he is not looking.'

In most of its habits the Tiger so much resembles the Lion that they need not be described. There is, however, one point in which it exceeds the Lion. Man-eating lions are comparatively rare, but man-eating Tigers are fearfully common, and depopulate whole districts. A single Tiger has been known to tyrannise over a district of thirty or forty square miles, every village being deserted by its inhabitants. It destroyed at least a hundred human beings in one year. Its immunity was due to two causes ; one being the natural apathy of the Oriental disposition, and the other the superstitious Hindoo idea that the Tiger

is a supernatural animal, with powers of doing harm even after death.

Sometimes the man-eater happens to be an old female who has a family. In this case, the cubs, being reared on human flesh, are man-eaters from childhood, and it is necessary to extirpate the whole family before human life is safe. Were it not for the presence of the British, many a large district in India would be depopulated. When a Tiger has been killed, the superstition of the natives again asserts itself. No sooner has the animal drawn its last breath than the native beaters rush upon it and try to burn off its whiskers, thinking that if this be done the animal will be deprived of its power over them after death. The beauty and value of a Tiger skin depend on the perfect condition of its whiskers, and the hunters use every effort to preserve them intact. But the natives ignore threats, persuasions, and bribes, and often, even after the skin is packed, obtain access to it to give effect to their superstitious desires. The paws and the little collar-bones of the animal are also believed to be powerful charms against evil.

In connection with the Tiger's liking for human flesh, it is a remarkable fact that it will usually pick a black man out of a mixed company, except perhaps in the Malay Peninsula, where it appears to regard a Chinaman as a rare tit-bit. When Chinese convicts in chains were engaged at work on the roads in the neighbourhood of Singapore, the prisoners were constantly snatched up by the cruellest foe that man has in the whole of the animal world.

The strength of the Tiger is gigantic, as may be inferred from the average girth of the forearm, which is little less than three feet, the girth of the neck being half a foot more. The average length of a full-grown male Tiger is nine and a half feet, and its weight is about 450 lbs. An old Tiger always becomes very cunning, and can conceal itself so effectually that even the keen eye of the native hunter is often at fault. The fact is that the dark stripes on the Tiger's fur harmonise so well with the shadows of the herbage in which the animal is lying, that it is almost impossible to distinguish one from the other.

The lion, perhaps mistakenly, has been accounted the

type of heroic animal perfection ; but the Tiger has ever been viewed as the emblem of bloodthirstiness, treachery, and unbridled ferocity. The latter is extremely pertinacious, and, unlike the lion, if its first attack is unsuccessful, it will not slink back to its retreat, but will pursue its victim with a speed and activity scarcely credible.

Of the Tiger's fierce and unprovoked onslaughts it would be easy to afford instances by the hundred, but the following will serve as an excellent example. A party of naval officers landed near the mouth of the Hooghly to shoot deer, which sport they followed for several hours. An eyewitness writes :—

‘About half-past three we sat down on the edge of the jungle, and had just commenced our meal, when a black servant informed us that there was a fine deer within six yards of us. Captain Downing and I immediately jumped up to take our guns ; mine was nearest, and I had just laid hold of it, when I heard a roar like thunder, and saw an immense Tiger spring on Mr. Munro, who was sitting down. In a moment his head was in the beast's mouth, and he rushed into the jungle with him with as much ease as I could lift a kitten, tearing him through the thickest bushes and trees, everything yielding to his monstrous strength.’

Though the poor youth was still in the creature's mouth, four shots were fired at the Tiger, which staggered as it disappeared. ‘A few minutes after, Mr. Munro came up to us, all over blood, and fell. He lived twenty-four hours in the utmost torture ; his head and skull were all torn and broken to pieces, and he was also wounded by the animal's claws all over his neck and shoulders. But it was better to take him away, though irrecoverable, than leave him to be mangled and devoured.’

The following furnishes an example of the muscular powers of the Tiger. An Indian peasant found a buffalo in a quagmire, in which it was so deeply embedded that all efforts to get it out were unavailing. While the man went to procure the assistance of his friends a Tiger appeared, seized the buffalo, and dragged it out. When help arrived, the immense Cat was carrying its prey towards the jungle,

but perceiving the party of men, the Tiger dropped the dead beast and made its escape. The buffalo was probably nearly a thousand pounds in weight, or more than twice that of the Tiger.

It is not only in the open that the Tiger is to be feared ; it often enters houses at night in search of prey. An educated Hindoo gentleman had a night encounter second to none as a blood-curdling experience without a tragic ending. While he was lying in bed, a huge Tiger entered the room and peered at him with his glowing eyes through the gauze mosquito curtains that surrounded the bed ; he was so close that his fetid breath was in the man's face. The brute probably viewed the netted bed as a trap and its occupant as the 'bait,' and the man held his breath in the hope that the creature's caution would master his desire for a meal.

But the pressure of the tiger's head caused a cord to snap, and down came the curtains. The spell was broken ! In the brief instant of respite allowed by the temporary surprise of the animal, the man slipped between the wall and the bed and crawled under it. The next moment the Tiger was tearing the netting and the sheets to shreds, only to find his prey had disappeared.

Speedily the animal located the man and made a wild dash to reach him ; but the bed was too low to permit the huge head to pass under it. By repeated efforts the cruel head with its fiery eyeballs was forced under the beam, whose sharp edge peeled the skin off the animal's forehead, which by no means improved his temper ; but he could make no further progress, and there man and beast lay separated by only a few feet ; the one paralysed with terror, and the other working his horrible jaws as though tearing flesh to bits.

Perceiving that the animal was fixed as in a trap, the man again withdrew to the bed, to throw his weight upon it just above the head of the tiger, which was frantically endeavouring in the narrow space, where its body was wedged, to get sufficient leverage to lift up the heavy load.

Calculating his chances to a nicety, the man paid a flying visit to the next room, where he procured a carving-knife, the only weapon available. He returned to the room, and

leaning over the shoulders of the Tiger, he drove the point of the nine inches of steel into the animal's heart. There was a terrific roar, the bed was hurled up and the man was dashed against the wall to sink into unconsciousness, in which he was found later by the side of the dead beast, which he had despatched by that one desperate thrust.

The Tiger is not infrequently trapped, and still more often it is attracted by the cries of a live bait, and is then shot by the hunters, stationed on a platform in a neighbouring tree. From the very nature of the Sunderbunds it is difficult to hunt the tiger in that region ; but in the Terai, the jungle belt approaching the foot of the Himalaya, there is more chance of success by beating the covert with elephants.

‘There is something very solemn and impressive about a tiger beat,’ says Major C. S. Cumberland. ‘There is a long line of black backs, the elephants moving at a funeral pace. Not a sound is heard but the swish of the grass as their huge carcasses brush along. At intervals down the line the sportsman stands up in his howdah. Every one is on the tiptoe of expectation, including the elephants, who know what they are there for.’

Sometimes the Tiger launches itself out of cover and springs on an elephant, clawing furiously at its hide, which, tough as it is, receives frightful lacerations. If the elephant can shake the beast off, it either kneels on it to crush it at once or gives it a kick that sends it flying twenty paces off with broken ribs. The elephant may even fall in the hope of rolling on its enemy, in which case the persons in the howdah are in considerable danger from friend and foe alike. ‘Usually a well-directed shot catches the Tiger fair, and over he goes. Or he may go on to lie up in a real thick place and take a deal of finishing, sometimes fighting and charging to the last, and sometimes dying like a cur, for Tigers, like human beings, vary much in character.’

Mr. Sainthill Eardley-Wilmot, late Inspector-General of Woods and Forests to the Government of India, returned to England in April, 1909. During his thirty-five years' service he killed 130 Tigers, nearly all of which he encountered while he was on foot in the course of his daily duty in the forests and jungles of India and Burma.

LEOPARD (*Felis pardus*).

Coloured Plate VI. Fig. 1.

Next to the lion and tiger the Leopard, or Panther, is the largest of the Cat family in the Old World ; it is more widely distributed, being found wherever the two former animals dwell, as well as in many regions where they are absent. There is considerable variety in size and colour, but making allowance for climatic differences, there is but little change in the Leopards all the world over. Usually the animal is from four to five feet in length, with a tail of about three feet. The ground colour in some cases is nearly white and in others jet black, but more commonly it is reddish or yellowish, and marked all over from head to foot and to the tip of the tail with black spots, each with a paler centre. Black animals are only indistinctly spotted ; they are usually found in the Malay Peninsula and neighbouring islands.

The Leopard is more compact in build than the tiger and has no vestige of a mane or tail tuft. Although a true Cat and constructed on the same model as the lion and tiger, it is very different in some of its habits. If a hunter be chased by either of the larger animals, and can climb a tree so far as to be out of reach of the animal's leap, he is perfectly safe, neither of these creatures being able to climb trees ; but the Leopard is quite at home in a tree, as even the agile monkey can painfully testify.

In Africa the Leopard is found from Algeria to within a few miles of Cape Town. In South Africa, where the Boers always speak of the animal as the *tijger*, next to the flesh of the Klipspringer, the favourite food of the spotted carnivore is the baboon. The rocks, among which the baboons live, also afford shelter to the crafty Leopard, and even the vigorous monkey sentinels cannot always detect the foe in time to give warning before one of their number is snatched away. Sometimes two or three 'old men' baboons will jointly offer fight to their enemy and rend the Leopard in pieces.

Small antelopes, bush pigs, rabbits, and birds, none come

amiss to the Leopard. It plays havoc with farm stock—calves, sheep, goats, and young colts. It generally seizes its prey by the throat, holding on until it is strangled or its spine is broken.

While civilisation has driven the lion further afield in South Africa, it is different in the case of the Leopard. Its numbers have been thinned, but it is difficult to exterminate an animal that is so strictly nocturnal and which hides in incredibly small places. It is still found even quite close to some of the large towns, where there are lurking places and where food is obtainable. Since the war it has increased in numbers considerably, for all the Dutch farmers were engaged in the military operations, and consequently there was no one left on the farms to take the usual toll of the spotted marauder.

Although seldom a man-eater, the Leopard, when it grows old, becomes a confirmed cattle-eater, hanging about the outskirts of villages, hiding itself in a most effectual manner, and whipping off daily at least a goat, pig, poultry, or especially a dog, which it almost prefers to a baboon. Sometimes it has recourse to a very cunning device. It takes up its quarters close to a village, showing itself rather ostentatiously, so as to put the inhabitants on their guard. Then at night it goes off to another village at some distance and helps itself at leisure, the inhabitants never suspecting its presence.

On rare occasions, the Leopard does become a man-eater, and is then even more dreaded than the tiger, inasmuch as it can leap farther and can climb trees. Its cunning, too, is greater than that of the tiger. One of these animals, which for a long time baffled the hunters, used to appear suddenly before a village and make an attack upon it, thus drawing all the armed men and the dogs towards it. The Leopard would then slink away into the bush, slip round to the opposite side of the village, which was left undefended, make a dash into it, snatch up a child, and make its escape with its prey. It showed its cunning in another way.

As a rule the large carnivora, when they have taken prey, eat to repletion and then sleep until they are again hungry,



1. Leopard

2. Cheetah



3. Lynx

4. Jaguar



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when they return to the carcass and make another meal. Knowing these habits, the hunters often kill the lion, tiger and Leopard by lying in ambush near the body of the prey and shooting the animal when it comes back to its feast. But this Leopard never made more than one meal from a victim, never appeared twice in the same place, and often contented itself with drinking the blood of its prey, not touching the body. It had also the habit of carrying the bodies of children into trees and hiding them in the forks of branches at some height from the ground. Of course, it killed far more human beings than it would have done had it made its meals after the usual carnivorous fashion.

On the whole the Leopard is more cowardly than the lion or tiger. It is, however, particularly dangerous when wounded, either coming straight for its foe to attack with teeth and claws, or else it seeks cover to spring out suddenly. In this latter respect it is certainly worse than the lion, and what it lacks in size compared to the tiger is more than atoned for in the greater length of its avenging leap.

An adventure with a Leopard at close quarters is generally something to be remembered, as illustrated in the following instance. Two Boers were returning from an antelope hunt when they met a Leopard in a mountain ravine. Like most of its tribe, the creature first tried to escape by climbing up a precipice, but being slightly wounded by a shot, it turned upon its pursuers with the utmost ferocity. It tore one man from his horse, bringing him to the ground, biting his shoulder and clawing his face and arms.

The second hunter fired in the hope of relieving his friend; the shot missed, and the infuriated animal turned upon its new antagonist. In one bound the Leopard was upon him, tearing his scalp over his forehead; and in the same moment man and beast, grappled together, fell over a steep declivity. In the meantime the first man had recovered his gun, but he could do nothing as his friend and the Leopard rolled over and over to the bottom of the steep bank. When at length he was able to lay the savage beast low, it did but hasten its death from the knife wounds of the hunter, who now lay dying with his throat practically torn out.

The Asiatic Leopards are no whit better than their African cousins : whether in Western Asia, India, China, Siberia, or Japan, and many a region between, the Leopard bears the same bad character. Feeding largely on putrid flesh, its bite more often than not causes blood-poisoning ; and it is always ready to satisfy its ravenous appetite with anything, from a cow to a bird on its roost.

In Central Asia is the beautiful Snow Leopard (*Felis uncia*), or Ounce, the colour of its long fur being white, clouded with a delicate grey and rosetted irregularly with black. The tail is long and bushy. A lady kept one as a pet for a long time, afterwards transferring it to the Zoo, where it was far more friendly than many cats. The lion and tiger, too, are frequently tamed, but such animal friendships often end in dire tragedy, the creatures being liable at any moment to be impelled by some wild impulse to exhibit their ingrained ferocity.

JAGUAR (*Felis onca*).

Coloured Plate VI. Fig. 4.

Of the cats inhabiting the New World, the largest and handsomest is the Jaguar, an animal which the European residents invariably miscall by the name of tiger. There is no difficulty in distinguishing the Jaguar from the true leopards. In the first place, when full grown, it is not much less than the tiger itself. Moreover, the rosettes of dark spots with which its fur is adorned have a black spot in the centre of each group. Then, when the animal is viewed in front, several bold black stripes are seen to be drawn across the breast and lower portion of the neck, which is never the case with the leopards of the Old World.

The Jaguar inhabits nearly the whole of Central and South America to Southern Brazil, from which it wanders to the pampas of the Argentine, attracted thereto doubtless by the vast herds of cattle. In the Amazon valley the animal lives largely in trees, chasing and catching even the active American monkeys, in spite of their additional limb in the form of the prehensile tail. It would not,

however, be so successful did it not trade upon the inquisitive and mischievous nature of the monkey race. They seem positively fascinated by the presence of the Jaguar, and cannot refrain from lingering in their flight or even trying to slap the Jaguar on the nose as they fling themselves past it. The Jaguar, on its part, bides its time, and, swift as is the spring of the monkey, the stroke of the savage paw is swifter still, and the unfortunate monkey falls a victim to its own vagaries. So swift, indeed, is the blow of the Jaguar's paw that the animal will take its place at a shallow bend of a river and scoop out the fish with its broad paws. The peccary, capybara, and, in fact, any creature furred or feathered, are all preyed upon by the Jaguar.

The body of the Jaguar is extremely robust, the limbs short, thick, and muscular; the head large and square; and its whole contour lacks the supple gracefulness that is so characteristic of its Old World cousin. It is the most formidable of the American beasts of prey; for though it seldom ventures to attack man, especially if on his guard, it unsparingly destroys horses, oxen, and other domestic animals. The mode of killing its prey is invariably the same; it leaps upon the back of its victim and by a powerful movement of the forepaws twists the head until the neck is broken. It is said that it attacks and even conquers the alligator on land, but that in the water the reptile gains the mastery. There appears never to have been an eye-witness of any such encounter; but a Jaguar has been surprised when making a meal off an alligator.

When floods drive the Jaguar from its favourite haunts and it finds it difficult to secure animals upon which to sate its ravenous appetite, it will attack man without scruple. At St. Fé two priests were killed as they entered the church, where a Jaguar was lying in wait behind the door; and more than one traveller can vouch for men having been seized and carried off while sitting by a blazing camp-fire.

In the settled regions the Jaguar is allowed but little scope for depredation. No sooner is evidence given of its presence in a district than a hunting party is arranged by the planters and ranchers, and they do not rest satisfied

until they have exterminated the unwelcome visitor. At any rate, there are not now two thousand Jaguar skins exported annually from Buenos Ayres alone, as Humboldt says was the case in his day, when he calculated that quite four thousand Jaguars were killed in South America every year.

PUMA (*Felis concolor*).

Coloured Plate V. Fig. 1.

Few animals have been gifted with more names than the Puma, which is the largest American cat next to the jaguar. Sometimes it is called the Cougar, but it is familiarly known by the names of Panther (corrupted into Painter) and the Lion. The last mentioned name has been given to it in consequence of the hue of its fur, which much resembles that of a true lion, being of a uniform dun. Hence the specific name, *cóncolor*, i.e., uniformly coloured. In some cases the animal's coat cannot fairly be described as dun, being more of a cinnamon colour tinged with gold, while the belly and chest are white.

Being able to endure great variations of temperature, the Puma has a wide range, extending from Montana to the south of Patagonia. In the northern animals the fur shows a marked seasonal change, being redder in tint in summer and greyer in winter. Strangely enough, the fur does not lengthen as a protection against the cold, as does that of the tiger in Central Asia.

The Puma is much smaller than any of the preceding Felidæ, its total length seldom exceeding six and a half feet, its height at the shoulder being about twenty-five inches. Considering its size, it is undoubtedly the boldest and fiercest of the cats. In the south it will attack the jaguar, from which it will snatch its still living prey; and in the north, with equal fierceness, it will overcome the grizzly bear.

In addition to preying upon deer, the capybara, viscacha, the rhea or American ostrich, and many other wild creatures, the South American Puma is a terrible scourge



1. DOMESTIC CAT.
(See page 131)

2. WILD CAT (SCOTLAND).
(See page 130)



1. CARACAL.

2. CARACAL CUB.
(See page 133)

3. OCELOT.
(See page 130)

to horse, sheep, and cattle breeders in the order given ; it has a mania for horseflesh, and the herds of wild horses are in danger of dying out owing to the constant loss of their colts. The northern animal is said to eat anything from deer to mice or fish, not even disdaining the malodorous skunk or the prickly porcupine.

The Gauchos make very short work of the Puma when they encounter it. First entangling its feet in the *bolas*, i.e., three cords knotted together, and having a stone or metal ball at the end of each cord ; and then, casting the noose of a lasso over it, they gallop away at full speed, making the helpless body rebound from the earth until the animal is dead. In the north the creature is relentlessly hunted with dogs, treed, and shot.

Notwithstanding the ferocious attitude of the Puma towards quadrupeds generally, it seldom attacks man, and sometimes will not even defend itself against him, resigning itself unresistingly to death which it might very easily escape. When a traveller has been sleeping in a hammock in the forest, the Puma has been known to lie on the ground underneath him, as though for the pleasure of human company. Mr. Hudson, in *The Naturalist in La Plata*, says :—

‘It is notorious that where the Puma is the only large beast of prey it is perfectly safe for a small child to go out and sleep on the plain. The Puma is always at heart a kitten, taking unmeasured delight in its frolics.’ There are various stories in proof of this cat’s generally harmless character that would be incredible were they not backed by good authority. In more than one instance a traveller would have succumbed to the attack of a jaguar, but that a Puma came to the rescue and put the bigger carnivore to flight.

It must, however, be admitted that such pretty instances of amiability on the part of the South America Puma are at least quite equalled in number by those in which the animal displays all the ferocity of its race, crouching and springing at mankind and biting and scratching in the manner characteristic of the attacks of the cats. An angry Puma is generally an opponent to be feared. Its leaping

powers are enormous ; it can reach with ease the bough of a tree that is twenty feet from the ground.

There are a large number of smaller tiger cats and leopard cats, possessing the beautiful coats and all the bloodthirsty characteristics of their larger brethren. The Ocelot (*Felis pardalis*), Plate IX. Fig. 3, of South America has a body three feet in length without the tail. Its fur is a mixture of grey and fawn, upon which are drawn longitudinal partially broken bands of fawn, black at the margins ; on the neck, head, and inner side of the limbs the bands give place to irregular spots and dashes. It can be easily tamed and kept as a pet. Mr. Waterton had one for some time, and found it very useful in extirpating rats.

The Fishing Cat (*Felis viverrina*) of India is brownish grey in colour, marked with dark brown or black spots. It is supposed to live largely upon fish, but although it is only two and a half feet in length from the nose to the root of the tail, it is fully capable of destroying calves, sheep, and dogs, and upon occasion carries off a Hindoo baby. There is one very well authenticated instance of the Fishing Cat's ferocity. A newly captured male broke into a neighbouring cage, where it destroyed a tame female leopard that was quite twice its size.

The Serval (*Felis serval*), Plate X. Fig. 3, is a spotted tawny cat with longer legs than the foregoing. The tail is ringed with black. It is found from Algeria to the Cape. It feeds mainly on hares, rabbits, rats, birds, &c., but it is large enough to pull down and kill the young of the smaller antelopes.

WILD CAT (*Felis catus*).

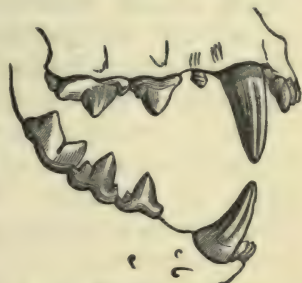
Plate VIII. Fig. 2.

The Wild Cat of Europe is one of the oldest inhabitants of Britain, but was never known in Ireland. It is now practically extinct in England, but still lingers in some parts of Scotland. When one hears of a Wild Cat being seen or captured in any other part of the country, it is almost sure to be but a feral cat, or one that has abandoned domesti-

cated habits for a free life in the woods. Animals that revert to a wild state soon become astonishingly fierce.

It is a matter for congratulation that the Wild Cat is on the verge of extinction, and the last one will be allowed to depart without regret, if it is only half as bad as Mr. Pennant painted it: 'The Wild Cat may be called the British tiger; it is the fiercest and most destructive beast we have, making dreadful havoc amongst our poultry, lambs, and kids. It inhabits the most mountainous and woody parts of these islands, living mostly in trees, and feeding only by night.' Upon occasion the animal proved its bad character to be understated, for in the church at Barnborough, in Yorkshire, was formerly a rude painting that testified to the fact that a man died in the church porch after being attacked by a cat. Even in captivity the creature remains absolutely intractable after years of confinement.

The Wild Cat ranges from the north of Scotland across Europe and Northern Asia to the northern slope of the Himalayas. In colour its soft and thick fur is usually grey or yellowish, with a black streak running down the back, from which fall transverse stripes down the sides; the tail is ringed with black. Including the rather short tail with its obtuse end, the animal is about three feet in length.



TEETH OF THE DOMESTIC CAT.
(Natural size.)

DOMESTIC CAT (*Felis domesticus*).

Plate VIII. Fig. 1.

It is impossible to say at what period cats became domesticated, but it is almost certain that the Egyptians were the first to make use of their undoubted good qualities.

The Domestic Cat is smaller than its wild progenitor, and shows endless variations in colour in the different breeds. Those most valued are the Persian variety. No animal exhibits more maternal fondness for its young; and it

is an exceedingly clean animal. Though the cat is the most familiar of our domestic creatures it does not attach itself to persons nearly so much as to houses. Thanks to its inherent hunting habits it is extremely useful as a vermin-killer. Notwithstanding that by descent it is a true carnivore, the Domestic Cat will eat vegetable food.

LYNX (*Felis lynx*).

Coloured Plate VI. Fig. 3.

Some naturalists consider that the several species of Lynx ought to form a distinct genus in themselves. They are decidedly less cat-like than any of the members of the family already described, especially in their longer legs, shorter tail, and pointed and tufted ears. The Lynx is a thickset, square-headed animal, three to four feet long, exclusive of the tail, with very strong paws and forearms.

The Common, or European, Lynx is found right across the northern regions of Europe and Asia, extending as far south as the Alps, Carpathians, Caucasus, and Persia. Owing to its great range and its ability to live in either very hot or very cold countries, there is considerable variation in colour. The Common Lynx has soft, thick fur, greyish or reddish in tint, and usually marked with black spots. The Southern, or Spanish, Lynx (*Felis pardina*) is of a redder shade, while the animal of Central Asia is paler and more uniform.

It is mainly a nocturnal forest-dweller, hunting small mammals and birds, following them even up to the tops of trees. It is the most destructive of the carnivores now left to plague Europe. To sheep and goats it is a relentless enemy, killing an animal instantly, devouring but a small portion of the body and leaving the rest. A single Lynx has been known to slay forty sheep in the space of a few weeks.

Being seldom seen, the animal is but little hunted unless it makes forays on the live stock of settled districts. In Norway the Lynx is now rather rare, but it has a worse character than the wolf, and in the Balkan Peninsula it works considerable mischief among the flocks.

The Canadian Lynx (*Felis canadensis*) is a timid, cowardly creature that is more or less common in the forest regions of Canada about as far north as the Arctic Circle. It seldom attacks any of the larger quadrupeds, preferring to subsist chiefly upon the hare. In this region the animal is hunted for its fur, and when face to face with the hunter it rarely does more than set up its hair and spit like an angry cat; but a blow on its back is generally sufficient to give it its quietus. Lynx skins at one time were sent to England in thousands by the Hudson Bay Company, but the animal now exists in greatly diminished numbers.

The Caracal (*Felis caracal*), Plate IX. Figs. 1 and 2, the handsomest of the Lynx tribe, is elegant in shape, light chestnut in colour, and not spotted as are many others of its kind. It is found throughout Africa, Arabia, Persia, India, and Tibet. In size it is considerably less than the Common Lynx. In the East the Caracal is trained to catch hares and birds, such as peafowl and cranes.

CHEETAH (*Cynælurus jubatus*).

Coloured Plate VI. Fig. 2.

The Cheetah is found throughout south-western Asia and in many parts of India, while a variety only differing in its fur is found in Africa, especially in the dry, open plateaus of Somaliland, East, and South Africa. In the last-named region the animal is known as the Woolly Cheetah (*Cynælurus lanea*).

There can be no doubt that the Cheetah belongs to the Felidæ. Its dentition is the same as in the leopard, but it is a slenderer animal, with a smaller head and longer legs. There is, however, a marked difference in the claws, which are only semi-retractile, which has caused modern naturalists to place the animal in a distinct genus.

The ochreous yellow fur is rather coarse and somewhat long on the neck and shoulders, forming almost a mane, as indicated in the specific name. The body and limbs are covered with circular black markings without pale centres; on the under-parts the colouring fades to white. Standing

about three feet high at the shoulder and with an extreme length of seven feet, the Cheetah is well set up and exhibits nothing of the crouching gait that is a common feature of the cats; nevertheless, the leopard itself is not more secretive and stealthy.

The chief point of interest concerning the Cheetah is the manner in which it is pressed into the service of man. When it is captured it is reduced to submission by starving it and keeping it awake, until it becomes pitifully abject and ready to be trained to engage in antelope-hunting, which is the favourite sport of the wealthy natives of India.

The Cheetah, or Hunting Leopard, as it is called, which soon learns its business as well as any falcon, is placed on a low car, where it sits quietly by the side of its trainer. When a party of antelopes is seen the sportsman drives towards them, but not making directly for their position. Being accustomed to seeing these vehicles, which are constantly used by the native agriculturists, the antelopes take no notice of the car, but allow it to pass within a hundred yards or so. Choosing some spot which will afford cover to the Cheetah, the keeper removes the bandage from the animal's eyes and points out the antelopes.

The Cheetah immediately slips off the car, taking care to do so on the side opposite the antelopes, and creeps swiftly and warily towards them, skilfully availing itself of any cover on its way. When it has crept as closely as it can do without discovery, it dashes boldly upon the antelopes, and with a few tremendous bounds flings itself upon the nearest animal, bearing it to the ground. The keeper immediately runs up and cuts the antelope's throat, so as to make it lawful meat. He then either cuts off a piece of the leg, or fills a ladle with the blood and offers it to the hunting cat. While the Cheetah is busied with its food the keeper slips the hood over its eyes, replaces it on the car, and looks out for more game.

FAMILY HYÆNIDÆ (HYÆNAS).

The remarkable animals called Hyænas in some respects form a link between the cats and dogs. The skull is cat-

like, while the claws, four on each foot, not being retractile, resemble those of the dog. They form a small but important group, which, like the rest of the animal kingdom, can only exist where their work lies. Their special office is to remove from the earth the carcasses and bones of the larger animals after death. For example, if a camel should die, the vultures, jackals, and other creatures begin to consume the soft parts almost before the breath is out of it. But the bones are beyond their power, and in order to remove them we have the Hyænas, whose jaws and teeth are formed for the express purpose of crushing the bones, which no other animal can break. The thigh-bone of a buffalo will be smashed almost with the sound of the report of a pistol-shot. It must not, however, be supposed that the Hyæna scavenger is restricted to bones; quite as often as not it is on the scene early to do its share of the picking.

It is quite evident that the Hyæna must possess particularly strong teeth, with massive jaws and powerful muscles to work them; the enormous bony ridges on



SKULL OF THE HYÆNA.

(About one-fifth natural size.)

the top of the skull mark the tremendous power in the jaw, since they indicate the size of the muscles which are attached to them. The teeth, of which there are four more than in the cats, are large and strong; the canines are smaller and the outermost incisors are much longer than in the Felidæ, and some of the molar teeth have three cutting edges. The tongue is set with prickly, spike-like *papillæ*, which form a powerful rasp.

The Hyæna is notable for the great development of the front part of the body and the very small size of the hind-quarters, which fall away rapidly and give the animal a peculiarly slinking gait. This peculiar formation is visible even in the skeleton. Its character does not belie its

appearance, for, in spite of its terrible jaws, it is a cowardly creature. Only when driven to bay will it turn upon its foes and fight with desperate courage, but as a rule it will not attack any enemy which will boldly face it.

The Hyæna is the veriest pariah of the animal world, and few writers are able to say anything too scathing concerning it. In his book upon lion-hunting in Algeria, Jules Gerard states that the Arabs hold the animal in utter contempt, and think that if any weapon of war, such as a rifle, a sword, or a spear, be used against a Hyæna, that weapon will desert its owner in the day of battle. Some Arabs, however, are less punctilious, and will not hesitate to eat the flesh of the animal, although it is so rank and offensive that even a hungry dog will not relish it.

There are three species of Hyæna, neither of which is now found in Europe, though the unlovely carnivore once ranged the Continent, and spread right across Asia to the shores of the Pacific.

STRIPED HYÆNA (*Hyæna striata*).

Coloured Plate VII. Fig. 1.

The Striped Hyæna inhabits a large portion of Africa from Senegal to Abyssinia, and thence into Asia Minor, Persia, and India as far as the Himalaya. Of a dirty-grey colour, with darkish transverse stripes on the sides and limbs, the animal is about five feet in length, including the tail. It is the size of a large mastiff, with head and neck of great thickness and enormous strength. Owing to the bowed and proportionately weak hind legs, its walk is a shuffling, awkward pace, but it can run with great celerity.

Only the Striped Hyæna is found in India. It is a solitary animal, and rarely are more than two seen together. It feeds principally at night, and conceals itself during the day in its den, among ruins, craggy rocks, or lonely thickets. As evening draws in the animal commences its prowl, haunting the streets of villages and towns, where it devours the offal and bones, for in many Eastern cities the inhabitants pay little heed to sanitary

matters. Cemeteries are favourite resorts, and from freshly filled in graves it will drag out the bodies that are not buried deeply. And all the time the hungry beast is on the look out for living prey, especially the ass, which is its favourite food, while cattle of all kinds are ravenously devoured.

During the ruthless wars which formerly constantly took place among the barbarous nations of Africa, Hyænas and vultures were regular attendants upon the field of battle. The dead were left unburied, the vultures gorged their fill, and the Hyænas completed the work, so as scarcely to leave a bone to commemorate the slaughter.

In modern times matters have improved, but it is interesting to note the testimony of Bruce concerning his encounters with the Hyæna. 'They were,' says he, 'the scourge of Abyssinia. From evening till the dawn the town of Gondar was full of them. Here they sought the different pieces of slaughtered carcasses which were exposed in the streets without burial. Many a time when the King had kept me late in the palace, on going across the square, I have been apprehensive lest they should bite me in the leg. They grunted in great numbers around me, although I was accompanied by several armed men, who seldom passed a night without wounding or slaughtering some of them.

'One night I went out of my tent and, returning immediately, I perceived two large blue eyes glaring at me in the dark. I called my servant to bring a light, and we found a Hyæna standing near the head of the bed with two or three large bunches of candles in his mouth, by keeping which he seemed to wish at that time no other prey. I was not afraid of him, and with a pike struck him as near the heart as I could. It was not until I had done this that he showed any signs of fierceness, but, upon feeling his wound, he dropped the candles and endeavoured to run upon the shaft of the spear to arrive at me, so that I was obliged to draw a pistol from my girdle and shoot him, and nearly at the same time my servant cleft his skull with a battle-axe. In a word, the Hyænas were the plague of our lives, the terror of our night walks, and the destruction of our mules and asses, which are their favourite food.'

A few writers maintain that no wild animal is more easily tamed or exhibits more affection, and Bishop Heber recorded that in India he saw a Hyæna which followed a gentleman about like a dog, and fawned on those with whom it was acquainted. Cuvier, that close observer of animals, believed that in a domestic state the Hyæna would 'doubtless render to man services of the same kind and degree as the canine species.'

SPOTTED HYÆNA (*Hyæna crocuta*).

Coloured Plate VII. Fig. 2.

The Spotted Hyæna roams all over Africa between a line drawn from Senegal to Abyssinia and Natal, where a few are still to be found. It is more massively built, and is larger, stronger, fiercer, and more aggressive than its northern cousin. It measures as much as six feet in length, including the sixteen-inch tail, and stands nearly three feet high at the shoulder. Its front and hind legs are not so unequal in length, and consequently its gait is less ungainly. Its usual cry is a horrible maniacal sound that has gained for it the name of the 'Laughing Hyæna,' although in South Africa it is far more often mistakenly called the Wolf or Tiger-wolf.

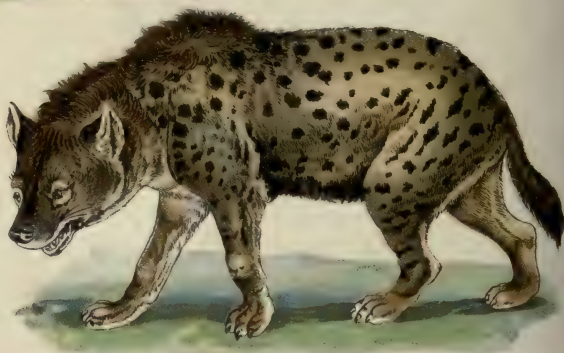
Unlike the Striped species, the Spotted Hyæna largely hunts in packs, carrying off the animals of travellers that are tethered near the camp, seizing sheep and calves out of the herds, and even snatching children from the arms of their sleeping mothers. Its appetite is most voracious, and the animal welcomes, if it does not prefer, putrid and decaying flesh.

The statement requires corroboration, but some travellers assert that the Hyæna stores up fresh food until it is sufficiently tainted to tickle its palate. Bearing this in mind was once the means of saving a hunter's life. While he was unharmed he fell in with a troop of Hyænas, and with great presence of mind lay down and shammed death. The animals examined him, turning him over with their gruesome snouts, and one gaunt creature bit him on the thigh,

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1. Striped Hyæna



2. Spotted Hyæna.



3. Wolf.



4. Jackal

as if to test the toothsome-ness of the prospective meal. The hunter concluded that he was considered too fresh for immediate use, for presently several of the Hyænas took hold of him and carried him a considerable distance to a cave, where he was dumped down in what the hunter's olfactory senses told him was the troop's larder. It was a ghastly situation. The vile odour of the reeking spot nauseated him, and yet he dare scarcely breathe lest the savage beasts should turn upon him and rend him.

At last the Hyænas took their departure—all save one animal that was left to guard the meat store. As the man lay in the foul den he racked his brains how he might evade the watchful animal that was stationed at the mouth of the cave. At intervals the Hyæna came and smelt him, until at the end of forty-eight hours the custodian of the larder set off to join the troop in a foraging excursion, or may be to lay information that the body was now deserving of serious attention. Which surmise was correct the prisoner did not stay to observe; he at once got on a trail that would lead him to safety in an entirely opposite direction.

Sir Samuel Baker describes how a Hyæna paid a visit to his tent at midnight. Lady Baker awoke her husband to inform him that one of the animals had been in the tent, but had bolted when she made an involuntary movement. The explorer's chief fear was that the beast would return and eat their saddles, so he lay back in bed with his rifle to his shoulder. In a few minutes the wary creature was again at the door, thrown into strong relief by the brilliant moonshine at its back. The explorer seized the opportunity, the trigger clicked, and the animal fell dead.

It is said that in some of the well hunted big-game regions the Hyæna has increased rather than decreased in numbers in recent years. The beast prefers to pick up its food ready killed rather than hunt it for itself. Frequently wounded animals escape into dense cover, only to die where the sportsman cannot find them; but the Hyæna follows up the blood trail, to find a meal without any more trouble than is entailed in the eating of it. In addition to this, many large animals are shot, and when they have been skinned the carcasses are useless to the hunter; and thus every season

the Hyæna finds itself in a perfect paradise of easily acquired food, which draws still more of its tribe to the region.

AARD WOLF (*Proteles cristatus*).

Plate XIV. Fig. 2.

The Aard Wolf of South Africa is sometimes classed with the hyænas and sometimes with the civets. It really belongs to neither, and is rightly placed in an intermediate group, called the *Protelidæ*. It is by no means a large animal, its extreme length being about three feet six inches. Its colour is yellowish gray, banded with dark stripes. The Aard Wolf, *i.e.*, the Earth Wolf, is a mighty burrower and sometimes excavates a common habitation, almost if not quite unique in zoology. Several of the animals will dig as many burrows, but they will terminate in a common chamber, though each appropriates to its own use the tunnel which it has dug. Carrion and white ants form the chief food of this hyæna-like animal.

**FAMILY VIVERRIDÆ (CIVETS AND
ICHNEUMONS).**

This Old World family of animals includes the Civet, Ichneumon, Mongoose, Genet, Paradoxure, and several others. The family gains its name from the civet, or pale yellow fatty substance which is secreted in two little pouches just under the tail of the true Civet. Most of the animals are sharp-muzzled, long in the body and short in the leg. They have five toes on each foot, and while some of them have the walk of the true cats, others are but semi-plantigrade; the claws, too, are only imperfectly retractile. The jaws are not so strong as in the cat tribe, but there are ten more teeth, six extra premolars and four additional molars, making a total of forty as compared to the thirty of the cat. The shape of the teeth likewise differs considerably; the canines are less pronounced, and the grinders, losing their shear-like action, have their surfaces raised in little lumps or cusps.

CIVET (*Viverra civetta*).

Coloured Plate VIII. Fig. 1.

This animal, a native of tropical Africa, and especially common in Abyssinia, is generally known as the Civet Cat. It varies considerably in size, but averages two to three feet in length without the fairly long tail; the height is from ten to twelve inches. In colour it is yellowish-grey, marked by dark blotches and broken dark streaks; the tail is darkly ringed, the bands getting fainter towards the tip. The Civet of India (*Viverra zibetha*), Southern China, and parts of Malaysia is a slightly bigger animal, with stripes replacing



SKELETON OF THE CIVET.

(One-tenth natural size.)

the spots, and the tail is marked by only five or six broad bands of white.

In habits the two animals are very similar, hiding in woods or thick grass during the day, wandering into the open at night, when they explore the neighbourhood of habitations. They are very destructive to small mammals and birds, preying upon fowls and ducks whenever opportunity offers, but also feeding on snakes, frogs, insects, eggs, roots and fruits.

The Civet, of either species, when captured, is placed in a cage too small to allow it to turn round, and two or three times a week the secretion is removed from the scent glands with a spoon. At Enfras, in Abyssinia, multitudes of Civets were kept in captivity for the purpose of supplying the markets with material for use in perfumery; Buffon states that the Dutch also kept large numbers of the animals.

When civet is mixed with other substances in certain proportions, the offensive strength of the perfume changes into an odour, aromatic and fragrant. It is less used now than formerly, but it is still employed in the preparation of various scents, and as much as forty shillings an ounce is paid for the substance.

ICHNEUMON (*Herpestes ichneumon*).

Coloured Plate VIII. Fig. 2.

The Ichneumon of Northern Africa, Asia Minor, and the South of Spain is the creature about which so many improbable stories have been told. Stripping the 'travellers' tales' of their exaggerations, it has been ascertained that the Ichneumon is a terrible foe to the crocodile, discovering the eggs which the reptile has buried in the sand and destroying them without mercy. As the egg of the crocodile is extremely small, the Ichneumon is obliged to eat many of them before its hunger is satisfied, and so the number of crocodiles is sensibly diminished by this one animal.

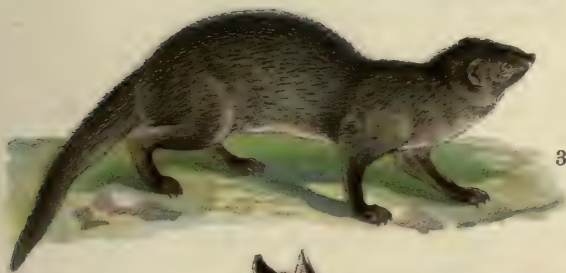
The Ichneumon does not depend wholly upon the eggs for its subsistence, but feeds on rats, mice, lizards, and snakes. It is easily tamed, and was formerly kept in houses, just as we keep cats, for the purpose of ridding them of vermin. Even at the present day it is sometimes kept for the same purpose. The reader will observe that the long, lithe body, snake-like neck, and slender head are exactly adapted for following its prey into their hiding-places. The word 'ichneumon' signifies a 'tracker.'

The common Ichneumon, or Pharaoh's Rat, as it is often wrongly called, is the largest of the species, measuring a few inches over three feet, the tail accounting for nearly half of it. It is peculiarly graceful and easy in its movements, and endowed with surprising agility; when irritated or about to spring on its prey, its eyes become vivid, its hair erect, and its whole aspect betrays great eagerness and ferocity. The fur of the little animal is of a uniform silvery grey, the tip of the tail being black; but each hair of the body, if examined separately, will be found ringed with white, dark,



1. Civet

2. Ichneumon



3. Mongoose

4. Common Fox



5. Arctic Fox

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and fawn colour ; its eyes are red, small, and sparkling ; its voice is soft and murmuring, and it often sits up like a squirrel in feeding.

MONGOOSE (*Herpestes mungo*).

Coloured Plate VIII. Fig. 3.

The Mongoose, or Mongoose, is a native of India, and in spite of its natural fierceness is quite popular as a domestic pet on account of its snake-destroying habits, which make it very useful in that serpent-haunted country. It is rather a smaller animal than the ichneumon. Even in England the Indian Ichneumon, as it is termed, is sometimes kept as a pet, and if purchased when young is as pretty, playful, and affectionate a creature as can be imagined.

Mrs. Brightwen, that well-known lover of animals, kept one for years that did not so much as wear a collar to remind him of captivity. 'He is never so happy as when curled up in the lap of some indulgent friend ; yet, as he unfortunately looks like a ferret, many people find it very hard to believe that he can be perfectly harmless.'

Though 'Mungo' would sometimes absent himself for hours, he always returned home, except upon one occasion when he got caught in a steel trap, which necessitated the amputation of a paw. So well did the wound heal that the limp could hardly be observed, and the little creature was as merry as ever, scampering about and playing with his own tail as lively as any kitten.

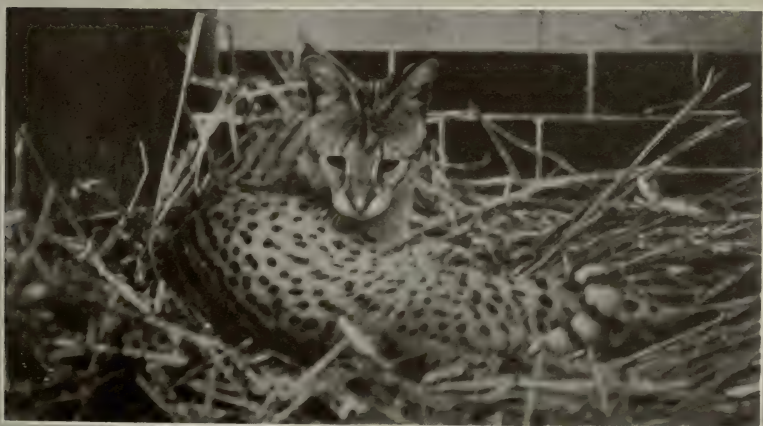
When bitten in its fights with poisonous snakes, the Hindus and Egyptians believe that the Mongoose has recourse to some plant as an antidote to the poison. In reality the nimble creature is very rarely bitten at all, avoiding the darts of the snake with wonderful adroitness. In any case it would be difficult for the reptile to drive its fangs through the harsh hair and thick skin of the Mongoose, which, however, is not afraid of a dose of poison, for it will eat a cobra's head, poison glands and all.

Rats are another pet aversion of the Mongoose, which

has been employed on many occasions to rid ships of the vermin, &c. In 1871 the sugar plantations of Jamaica were plagued by rats, until nine Mongooses were turned loose in the island. Within a few months their numbers were increased considerably, and very speedily the effect was visible; fewer rats were caught in traps, and fewer canes were destroyed. From that time the island ceased to trouble about the rats, but as the Mongoose had still to get a living for itself and family, it behoved the planter to watch his henroosts; but it is easier to keep a Mongoose out of enclosed premises than it is to keep rats out of open plantations.

Closely allied to the civet is the Genet (*Genetta vulgaris*), Plate X. Fig. 2, with its still more weasel-like body, slender and elongated, its short limbs, and sharp pointed muzzle. It is a native of Africa, north of the Sahara, which separates the animals of a great part of the continent in the north from those of the equatorial belt, as effectively as though the wilderness of sand was one of the great oceans. The animal also extends into Syria and the southern countries of Europe, where it is largely domesticated for the purpose of destroying rats and mice, lizards, snakes, &c., which often infest houses in warm countries. Owing to the shortness of its legs, the Genet can make its way into very restricted spaces in search of its prey. It is a beautiful grey animal spotted with brown, with a black muzzle and a ringed tail. The Genet possesses a scent pouch a little more pronounced than the ichneumon's, but still very inferior to that of the civet.

The Paradoxures are called Palm Civets, Tree Cats, or Toddy Cats. The generic name means 'queer-tailed,' because some of the animals twist their tails screw fashion, bringing the underside uppermost. The common Paradoxure (*Paradoxurus musanga*), the Palm Civet of India and Ceylon, has a body quite twenty inches in length, with a tail only an inch or two less. The Binturong (*Arctictis binturong*) of Burma, Assam, and the regions beyond, is nocturnal and omnivorous, with a prehensile tail to help its rather slow movements. The Meerkat or Suricate (*Suricata*



1. SURICATE.

2. GENET.

3. SERVAL.
(See page 130)

(Photos W. S. Berridge, F.Z.S.)



1. FOX TERRIERS.

2. POINTER.

3. GREYHOUND.

tetradactyla), Plate X. Fig. 1, pops in and out of its holes in the South African veldt like magic ; while the *Cynogale* (*Cynogale bennetti*), an animal of Malaysia, has webbed feet and very much the same habits as the otter.

FAMILY CANIDÆ (DOGS).

Under the general title of Dogs are included not only the Dog proper, wild and domesticated, but also the wolf, jackal, and fox, each of which constitutes a more or less natural division among the many species that make up the family. The Dogs are more widely spread than any of the foregoing Carnivora, and in those that are to follow they are second in this respect only to the weasels.

The Dogs, with one exception, have five toes on the fore feet and four on the hind, to which latter a small rudimentary claw is sometimes added. The blunt claws with which the toes are furnished are not retractile. In gait they are all Digitigrades. The paw of a dog is not the perfect weapon of a cat, and hence a dog always attacks at once with its teeth, never beginning with a blow of the paw.

It is easy to distinguish the Dogs from the cat tribe by their elongated muzzle, and with few exceptions their larger number of teeth, viz., forty-two instead of thirty, the extra teeth consisting of six each additional premolars and molars. Their strength of jaw is very great. The senses of smell, sight, and hearing are very acute. Except in the fox the pupil of the eye is round and not elongated as in the cat. When tired by exertion a Dog pants and lolls out its tongue, through which organ it perspires.



SKULL OF THE DOMESTIC DOG.

(One-fourth natural size.)

In addition to its uses in chewing and swallowing, the Dog's tongue acts as a cooler and sweater.

In marked difference to the cats, the Dogs are very gregarious, collecting in packs for the joint hunting of their prey. They are more intelligent than any other of the Carnivora, and practically all of them are tamable, though in varying degrees.

DOG (*Canis familiaris*).

Plates XI. and XII.

The Domestic Dog has been from time immemorial the friend and companion of man; yet its original stock still remains a matter of considerable doubt, since, excepting the wolf and the jackal, we know of no wild beast to which we can refer with anything like certainty as its primeval ancestor. Naturalists, however, incline to the belief that the Dog owes its origin to the wolf or the jackal, or both together.

The Dog is commonly mentioned in the Bible, but always in terms of disparagement or contempt. Dogs were domesticated and tolerated around houses only because they were considered useful as scavengers. At this day, every town, from the greatest to the least, in Palestine swarms with lazy filthy curs that impede pedestrians in the daytime and howl hideously throughout the night. Doubtless the life which the Dog leads in the East tends to make it mean-spirited and greedy, and being a constant devourer of offal renders it impossible as a pet.

Of the domestic Dog there are so many varieties, and their forms are so diverse in shape and size, that if half of them were described they would occupy the entire volume. The outstanding feature of the Dog is the creature's affection and intelligence, and thousands of instances could be given where training, added to natural instinct and reason, place the 'friend of man' in the very forefront of the brute creation.

Of our own Domestic Dogs there is a long series of animals, ranging from the Mastiff, attaining a height of as much as thirty-three inches at the shoulder and a weight of

one hundred and seventy-five pounds, down to the Toy Terrier, only a few inches in length. Many of them are too well known to call for individual description, even if space allowed, and only those possessing some notable characteristic will be so much as mentioned.

The Sheep Dog, or Collie, as it is often called, is one of the cleverest of the Dog tribe. To see it at its best one must watch its operations amid the hills of Wales and Scotland, collecting and driving sheep to any point that its master desires. It is a remarkable fact that, when alarmed, the sheep will run to the Dog for protection.

The Newfoundland Dog has its feet partially webbed, which provision specially adapts it for swimming. At times innumerable it has saved the lives of drowning persons, who would have perished long before human aid could have arrived.

The St. Bernard, one of the noblest of the Dogs, for ages has been trained by the pious monks of the monastery of St. Bernard in the Alps to rescue travellers who have lost their way in the snowdrifts in the mountain passes. 'Barry,' one famous animal, saved no less than forty lives, and lost his own life while engaged in a further rescue. In our country there is no opportunity of utilising the St. Bernard's services in this direction ; but the breed is very popular, and as much as £1,500 has been paid for a prize animal.

The Setter, Pointer, and Retriever are particularly useful sporting Dogs. Either of the two former will go running ahead, and the moment a bird, rabbit, or hare is scented the Dog stands still, with its limbs rigid and tail stretched out behind it. This action is called a 'point,' and indicates to the sportsman the presence of game. When the game has fallen to the gun, the Retriever will bring it to the foot of its master. Upon one occasion a wounded partridge escaped into a ditch, from which a little later the dog emerged, carrying a rusty old kettle by its handle, which to the amusement of the party it added to the heap of dead game. Only then was it discovered that the partridge had taken refuge in the kettle.

The Chow, something like the Pomeranian breed in shape is a popular pet Dog in England. It is often a shade of red

or black, and its tongue is blue-black in colour. The Dog is better off in England than in its native home, for John Chinaman views it as a special delicacy, and fattens it up for the table.

It must be remembered that all the different 'breeds' are purely artificial, and if a number of mastiffs, greyhounds, bulldogs, poodles, terriers, &c., were landed upon an island where they could obtain food, but would not see a human being, in a few years all the 'breeds' would vanish, and in a few more their descendants would revert to the wolf-like semi-wild Dog, which still infests the cities of the East.

To return, however, to the original stock of this useful animal. There are evidences that the Domestic Dog existed among the prehistoric savages of Europe, and in some of the ancient nations was worshipped as a god. May we not believe that when man 'went out to till the ground from which he was taken' the Dog was expressly given to him as his assistant and ally? Of all animals the Dog alone is identified with its master's interests and pursuits; other animals may be said to endure his dominion, but the Dog is one of the family, knows his looks, his voice, his walk, rejoices at his approach, solicits his notice, and defends his person.

ESKIMO DOG (*Canis familiaris* var.).

Plate XII. Fig. 1.

This variety of Dog deserves extended notice if only because it is a necessity of life in the northern regions. Its size is about that of a mastiff, and it has a firm, muscular figure, thick furry hair, and bushy tail curled over its back. When it sleeps, it can curl its tail over its nose, tuck its feet under its body, and be warm during its repose amid an intenseness of cold that words can scarcely convey. Besides possessing this thick coat, the Eskimo Dog is an astonishingly hardy animal, capable of sustaining life under conditions that any other breed would find intolerable.

Inhabiting the arctic regions of the American continent and the adjacent islands, the Eskimo look to their Dogs for assistance in the pursuit of the seal, the bear, or the rein-



1. ESKIMO DOG,

2. POODLE.

3. NEWFOUNDLAND DOG.



1. CAPE HUNTING DOG. 2. DINGO.
(See page 151)

(Photos W. S. Berridge, F.Z.S.)

deer ; nor is this all : they yoke them to heavily-laden sledges, which with untiring patience these animals will drag from one hunting ground to another. The following extract is from Captain Parry's *Journal of a Second Voyage for the Discovery of a North-west Passage* :—

‘When drawing a sledge, the Dogs have a simple harness of deer or seal skin going round the neck by one bight and another for each of the forelegs, with a single thong leading over the back, and attached to the sledge as a trace. Though they appear at first sight to be huddled together without regard to regularity, there is, in fact, considerable attention paid to their arrangement, particularly in the selection of a dog of peculiar spirit and sagacity, who is allowed by a longer trace to precede the rest as a leader.

‘The leader is usually from eighteen to twenty feet from the fore part of the sledge, and the hindmost dog about half that distance, so that when ten or twelve are running together, several are nearly abreast of each other. The driver sits quite low, on the fore part of the sledge, with his feet overhanging the snow on one side, and having in his hand a whip, of which the handle is eighteen inches, and the lash more than as many feet.

‘Though the Dogs are kept in training entirely by the fear of the whip, and, indeed, without it would soon have their own way, its immediate effect is always detrimental to the draught of the sledge, for not only does the individual that is struck draw back and slacken his trace, but generally turns upon his next neighbour ; and this passing on to the next, occasions a general commotion, accompanied by the usual yelping and showing of the teeth.

‘The Dogs then come together again by degrees, and the draught of the sledge is accelerated ; but even at the best of times there is the constant entanglement of the traces, by the dogs repeatedly doubling under from side to side to avoid the whip, so that after running a few miles the traces always require to be taken off and cleaned.’

With ‘good sleighing’—that is, on good roads—‘six or seven dogs will draw from eight to ten hundredweight, at the rate of seven or eight miles an hour, for several hours together.’ With a smaller load they will run ten miles an

hour, and are, in fact, almost unmanageable. To the women, who nurse them when they are ill and treat them with greater kindness than the men, the Dogs are affectionate in the highest degree. From the men they receive little except blows and rough treatment ; still they are faithful and enduring.

WILD DOG.

In various parts of the world there are Wild Dogs, of which it is impossible to say whether they are of the original stock, or whether they are the descendants of once domesticated animals, which at some time deserted into the woods, in a country where game abounds, there shifting for themselves and becoming the ancestors of a numerous race.

The Pariah Dogs of India are a sort of half-domesticated breed, which roam about the towns and villages, where they fulfil the office of scavengers, devouring the offal of the markets and clearing the streets of refuse. They are generally ugly brutes, coarse-skinned, blear-eyed, and scrubby-tailed. Though treated kindly by the public, they are absolutely ownerless, and have no idea of human companionship. In the large cities the Dogs divide themselves into communities, each of which is restricted to a certain area, and if an animal strays from its own quarter of the town it is immediately driven back by the pack into whose domain it has intruded.

These remarks apply not only to the Dogs of India, but of other Eastern countries also. It is the same dog that is so often mentioned in the Scriptures as a ravening beast ; which licked up the blood of Ahab ; and which so terribly fulfilled the prophecy that ' the dogs shall eat Jezebel in the portion of Jezreel, and there shall be none to bury her.'

Quite different is the Red Dog of the Deccan. It is not a city dweller, but roams in troops through the jungles. It is individually a match for any of the smaller mammals, for it is ferocious and wonderfully bold ; but in the pack it will cause even the tiger hastily to desert its freshly caught prey and take refuge in the low fork of a tree, there in impotent wrath to watch the disappearance of its meal.

The Cape Hunting Dog, or Wild Dog of Africa (Plate XIII. Fig. 1), represents a distinct genus, for it has only four toes on each of its feet, and is spotted something like the hyæna. Hunting in packs, it is the scourge of the continent, and in particular it lays a heavy toll upon the antelope family. In the neighbourhood of settlements these organised marauders will kill cattle and sheep. Dashing into a herd near a house, the Dogs will select an animal and drive it away over the nearest rising ground. Once over the ridge, they kill it and pick its bones before a horse can be saddled and some one come to the rescue.

The Dingo (Plate XIII. Fig. 2) was at one time extremely numerous throughout Australia and New Zealand; in the former it is getting rare, and in the latter it has been exterminated. The early colonists suffered immense loss from the raids of the Dingo, which, something like the fox in its life and habits, would play havoc with the sheep and poultry. The animal is interesting as being one of the few Australian mammals outside the Marsupial group; and no end of discussion has waged around the question whether it is really an indigenous animal or a descendant of some of the Dogs of Asia, introduced into the island long ages ago.

It is a point worth noting, as bearing upon the probable origin of the domesticated Dog, that the various wild species are easily tamed when caught young, and that the domesticated and the wild animals often breed with each other. A wolf and a dog or a jackal and a dog will mate together, but a fox and a dog never.

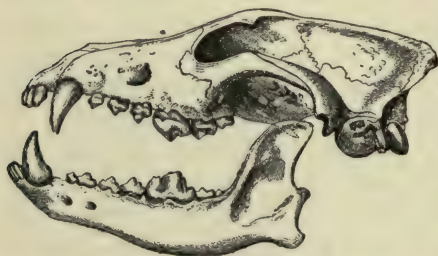
WOLF (*Canis lupus*).

Coloured Plate VII. Fig. 3.

Different species of Wolves rank next to the bears as formidable beasts of prey in the northern parts of both the Old and the New World. The European Wolf is coated with thick, coarse, yellowish-grey hair. Standing about two feet high, it measures over four feet from the

end of the nose to the tip of the tail, though in exceptional cases it is nearer six feet. In character it is skulking, cowardly, savage and voracious.

The Wolf is noticed in several passages of the Holy Scriptures, and always with an allusion to its cruel and savage disposition. The animal still abounds in the colder and more mountainous parts of Europe, and in winter the depredations of the packs are a serious matter. During severe weather Wolves from the Carpathian Mountains and from Russia cross the frozen rivers as far as to the Ardennes Forest in the south-east of Belgium. In the early part of last century, in Livonia, a province of Russia, only six times the area of Yorkshire, in one year Wolves destroyed nearly two thousand each of horses and cattle, fifteen thousand



SKULL OF THE WOLF.
(Nearly one-fourth natural size.)

sheep, over two thousand goats, and four thousand swine, together with calves, lambs, kids, dogs, geese, and fowl in smaller numbers.

We can readily believe that the Wolf was at one time a terror in England. The month of January was called

'*Wolf-monat*' by our Anglo-Saxon forefathers, 'because people are wont in that moneth to be more in danger to be devoured of Wolves than in any season of the yeare.' King Edgar forced the Welsh to pay him annually a tribute of Wolves' heads, but the animal was common in English forests for many centuries after Edgar's reign. Like the eagle, the beast lingered in Scotland long after it was extirpated from England, the last specimen being killed in 1680; and in Ireland it survived still longer, for in the eighteenth century a reward was claimed for Wolf-killing.

The history of the Wolf in Europe is a tragical record. It rarely attacks man except under stress of extreme hunger; but there are many stories told of packs of Wolves chasing sledges in winter. By taking advantage of a characteristic

of the Wolf, a well armed traveller has often reached a place of safety. When the pack is in full cry and the occupant of the sledge fires into them, the wounded animal is at once fallen upon by its companions and devoured. During this respite the sledge has made good progress, only to be overhauled again by the hungry beasts, when the driver repeats his manœuvre. Sometimes the ammunition has failed and horses and travellers have been devoured.

Almost incredible are the tales which are told of the ferocious obstinacy of the Wolf when it casts aside its natural fear and dread of man. A man-eating Wolf is more to be feared than lion, tiger, or leopard. It is a dog, and has far more intellect than any of the cats. It has a way of working in concert with other Wolves, one diverting attention while the other makes off with the prey. No one ever heard of a troop of lions, tigers, or leopards chasing prey in concert. A lion and his mate will sometimes work together, but the capacity for chasing prey in packs belongs to the dogs and not to the cats.

‘In the commencement of the reign of Louis XIV., in the depth of winter and of the snows, a large party of dragoons was attacked near Pontarlier, at the foot of the mountains of Jura, by a multitude of Wolves. The dragoons fought bravely and killed many hundreds of them ; but at last, overpowered by numbers, they and their horses were all devoured. A cross is erected on the place of combat, with an inscription in commemoration of it, which is to be seen at this day.’

By taking joint action the Wolf is enabled to overcome other animals that would outrun or overpower it singly. Half-a-dozen Wolves will stalk an antelope and stealthily form a cordon round it, or drive it to a point where one of their number is lying in ambush. Buffaloes, too, are killed by the brutes in an ingenious manner. In an ordinary way and with ordinary animals a buffalo is a tough customer, but the Wolves contrive their business very effectively. They drive the doomed animal to the edge of a cliff, over which they force it by flying at its nose. Their purpose accomplished, the Wolves jog quietly down and pick its bones.

The cunning of the Wolf sometimes degenerates into cowardice. It is afraid of anything that looks like a trap, and will never venture into a space which has been enclosed by poles connected by a rope. In Norway the electric telegraph proved quite an unexpected blessing. The wolves mistook the wires for a new kind of trap and never dared to pass beneath them.

Notwithstanding all that has been said of the naturally savage disposition of the Wolf, it has sometimes become domesticated ; but, as in the cases of tame lions and tigers, the result is more a proof of the triumph of the dominating art of man, than evidence of a relenting nature in the animal. In Munich was once to be seen a vehicle drawn by two enormous Wolves, which a Russian merchant had captured when very young and tamed to his service.

The true Wolf, restricted to the Northern Hemisphere, is found all over Europe, Northern, Central, and Western Asia, Northern America and the North of Africa. Except in a few regions the animal is the common species, whose habits are more or less similar all the world over. In the more northern regions of America and Asia, in winter it may have a lighter coat ; but an albino Wolf is little more than a freak (Plate XV. Fig. 2). The Indian Wolf (*Canis pallipes*) is less gregarious than the common species, and in some districts makes a speciality of preying upon children. The superstitious natives believe that the little victims are sometimes suckled by the she-Wolf, who thus completely changes their nature. In early times European nations held somewhat similar beliefs, e.g., the Anglo-Saxon *Were-Wolf* was a mythical being, who could assume the form and nature of a Wolf at pleasure, delighting in human flesh and deeds of horrid cruelty.

The Coyote, or Prairie Wolf (*Canis latrans*), Plate XIV. Fig. 1, of the United States and Southern Canada is smaller and not nearly so ferocious as the common Wolf, although it is the unrelenting foe of all young creatures. When animal food fails, however, the Coyote readily makes up for the deficiency with leaves and berries. Just as in the old days packs of Coyotes followed the prairie caravans, so now do the animals station themselves along the trans-

continental railway lines in the hope of picking up the waste scraps thrown from the dining cars.

JACKAL (*Canis aureus*).

Coloured Plate VII. Fig. 4.

The Jackal rather exceeds a large fox in size, though its tail is not so long proportionately, nor so bushy as in the latter animal. It is an inhabitant of the Old World, the common species being found in the South-east of Asia and onwards to India and Ceylon, and practically the same animal ranges through Egypt and Abyssinia. Several other species extend throughout Central and South Africa from Nubia to the Cape.

The common Jackal of India shows considerable variation in colour, but as often as not it is mottled black, grey, and brown on the back, with the under fur brownish yellow; the limbs are more or less foxy red, with the tail a darker shade. The name *aureus* is derived from the yellowish tinge of the fur.

The Jackal only measures from two to two and a half feet without the tail; the ears are pointed; the pupils of the eyes are round, and the skin exhales a strong and offensive odour. It hunts in troops or packs, pursuing the antelope and other animals for its prey, as well as rendering useful service in clearing the country and suburbs of towns and villages of carrion in every stage of putrefaction. The animal has been called the 'lion's provider,' and is popularly supposed to hunt down the quarry for the royal beast. It is far more likely that when the cry of the Jackal is heard the lion makes its appearance, and seizes without any ceremony upon the booty, leaving the Jackals to clear up the remains of the repast.

Most travellers agree in the terrific effect which the cry, or rather shriek, of the animal produces, resounding during the stilly darkness of the night from a hundred throats.

In many cases the fox of the sacred writers more properly refers to the Jackal, especially where mention is made of feeding upon carrion. The fox is not a carrion-eater by

choice, whereas the Jackal prefers it, and resorts even to graves and cemeteries to satisfy its ghoulish taste. We read that Samson 'went and caught three hundred foxes and took firebrands,' which he tied to the animals for the purpose of burning the cornfields of the Philistines. The difficulty of procuring three hundred foxes would be very great, since the animal is not gregarious and would require to be captured singly, whereas Jackals might be captured in a drove.

The Black-backed Jackal (*Canis mesomelas*) of South Africa is the handsomest of its race, having its back adorned with black, broken with silvery hairs and tufts. During the South African War the Jackals, like the leopards, very greatly increased, owing to there being no men on the farms to keep down their numbers. This animal is particularly destructive to sheep and lambs, leading to Government rewards for its capture, viz., seven shillings and sixpence per head.

In India and South Africa sportsmen often regularly hunt the Jackal in the same manner as the fox is chased in England. The animal can be tamed with ease, and exhibits most of the manners of the dog, even to the wagging of the tail when pleased. In a few generations it could be completely domesticated and rendered capable of useful service to man.

FOX (*Canis vulpes*).

Coloured Plate VIII. Fig. 4.

Of the common Fox, our own British animal, the terror of the farmyard from its voracity and the favourite object of the chase in England, almost endless interesting information might be afforded. If the animal had not been preserved for purposes of sport, in the British Isles it would long ago have been as extinct as the wolf. With slight variations in size and strength and colour, the common Fox is found throughout Europe, Northern and Western Asia, and Northern Africa; in India and North America are various allied species.

The British Fox, as represented in the coloured plate, is



1. PRAIRIE WOLF.

(See page 154)

2. AARD WOLF.

(See page 140)

(Photos W. S. Berridge, F.Z.S.)



1. FENNEC.
(See page 159)

2. ALBINO WOLF.
(See page 154)

(Photos W. S. Berridge, F.Z.S.)

mainly of a reddish-brown colour, with the under parts and the tip of the tail white; the outer surfaces of the ears and some portions of the limbs are often quite black. It is about two feet in length, with a bushy tail a foot or more long, which chiefly distinguishes the animal from the dog. Another point of difference is that the pupil of the eye is less round and contracts into a mere slit, for which reason chiefly the Fox is sometimes classed in a genus separate from the dogs.

The Fox is generally a solitary animal, living in an 'earth' of its own excavation, although it sometimes appropriates the burrow of the badger. It is practically omnivorous in diet; its general prey consists of hares, rabbits, and ground birds, rats, mice, and even frogs, beetles, and worms. It has a mania for poultry, as the British farmer often learns to his cost.

The cunning of the Fox is proverbial, and space alone prevents a description of some of the artifices to which it will resort to outwit the hounds. After a chase of no less than twenty-seven miles a hunted animal has finally escaped from its foes; and although not supposed to be a tree-climber, in the forest of Savernake a Fox was found hiding in the foliage at a height of thirty-seven feet above the ground. One more instance of the creature's cunning and courage must suffice.

A well-known taxidermist had the body of a Fox sent to him to be stuffed. The animal had only three feet, but on opening it the missing foot was found in its stomach. There could be no doubt that the Fox had been caught by the foot in a trap, and, in order to escape, had bitten off and swallowed the imprisoned limb. Rabbits, when similarly caught, tear themselves away, leaving their feet in the trap, together with the sinews; while the cat, when taken in a snare, seldom has the courage to tear itself away, and never would dream of biting off the limb.

In affection for its offspring the Fox is scarcely surpassed by any other animal. The vixen seldom has more than five cubs, and she will defend them with great courage. More often, however, she exercises her wits to protect her progeny. When she has suspected that her den has been

discovered, she has been known to remove the litter a distance of three miles in a night. She could only carry one of her young at a time, and if the cubs numbered four, their removal entailed journeys that totalled up to twenty-one miles.

All Fox skins are of value, and where the animal exists in great numbers they become an important article of export. In South America is found the Cross Fox (*Canis decussatus*), a red Fox with a black cross on its neck and shoulders. A skin of this animal is worth several pounds. It should be noted that the price of furs varies constantly according to the supply, and not a little on account of changing fashions.

ARCTIC FOX (*Canis lagopus*).

Coloured Plate VIII. Fig. 5.

The Arctic Fox is common within the Arctic Circle. It is smaller than the red Fox, and is coated with thick, long hair quite to the soles of its feet. In summer it is a grey or even a bluish shade; but, in common with other polar animals, the fur lightens in winter to a pure white. Late in autumn this species collects in multitudes in such regions as Hudson Bay, migrating southwards, where they remain until the following spring. Trappers capture the animal in vast numbers; the skins are useful, but less in value than those of the red Fox.

In some of the islands of the Bering Sea the Blue Fox is reared for the sake of its valuable fur. This species retains its colour all the year round. The animals feed chiefly on seal flesh, of which, in the sealing season in particular, there is plenty and to spare.

Another native of Northern America is the Black or Silver Fox (*Vulpes argentatis*). The animal is exceedingly rare; its fur is among the most valuable in the world. Its colour is a deep black, the long hairs all terminating in white, which produces a singularly beautiful effect, whence the title 'silvery.' The imperial pelisse of the Czar of Russia, made of the black necks of the Silver Fox, was exhibited at Hyde Park in 1851. It was valued at £3,500.

FENNEC (*Canis zerda*).

Plate XV. Fig. 1.

There are many species of Fox, but none so quaintly pretty as the Fennec of Northern Africa. It appears to have been first noticed by the celebrated traveller Bruce, who discovered it during his endeavours to reach the source of the Nile. Its ears and tail are so large and its body is so small that it looks as if it were made of a pair of ears and a tail, to which a body had been attached as an afterthought. From the nose to the root of the tail the Fennec measures barely a foot, the bushy appendage being eight inches in length. Its colour is pale fawn and its eyes are blue. Like the rest of the foxes, it is nocturnal in its habits, and remains during the day in holes and burrows which it digs in the sandy soil.

FAMILY MUSTELIDÆ.

This family forms a most heterogeneous collection of carnivorous animals, which are found in all parts of the world with the exception of the West Indies and Australasia. Differing much among themselves in size, and including burrowers, tree-climbers, and animals distinctly aquatic, it would be almost useless to attempt to describe characters common to all, except certain physiological similarities, as, for example, the organs of digestion.

Many of these animals are classed as 'vermin,' but that derogatory term does not depreciate the value of the magnificent furs with which many members of the family are coated. Numerous as the animals are, they conveniently divide into three sections, or sub-families:—

1. *Mustelinæ*, or true Weasels, *e.g.*, Weasel, Marten, Polecat, Stoat, Glutton, &c.
2. *Melinæ*, *e.g.*, Badger, Skunk, &c.
3. *Lutrinæ*, or Otters.

Sub-Family Mustelinæ.

The majority of these animals are small, the Wolverine being quite a giant among them; but even the smallest

of them possess strength out of all proportion to their size. The muzzle of the small head is pointed; the teeth are sharp and thoroughly carnivorous in character. Their relish for blood is strong, and only their inferiority of size prevents their being among the most formidable of animals. Their bite is keen and deep, and they generally fix upon a vital part where some large vein invites them, and there hang until their victim expires. From their slender, elongated figure they are termed vermiform (or worm-like) mammals. They worm their way in and out of the smallest crevices where it could hardly be supposed possible for them to enter; and they climb with remarkable adroitness, thanks to their short, strong limbs and sharp claws. More or less nocturnal in habit, the Weasel tribe carry death to every creature smaller than themselves and to not a few that are much larger. Most of the Weasels give off a disagreeable odour from glands which are placed beneath the root of the tail.

WEASEL (*Putorius vulgaris*).

Coloured Plate IX. Fig. 6.

The whole of the true Weasels are terribly bloodthirsty, and the common Weasel, the smallest and commonest of its race, is second to none in its determination and fierceness. The animal is found in most countries of Europe and is still more abundant in North America. The generic name (*putorius*) means bad smelling.

The Weasel is but seven or eight inches in length without the tail, which is another two and a half inches. The body is remarkably attenuated and cylindrical, the flattened head, with its pitiless eyes, merging almost imperceptibly into the neck and the neck into the body, this worm-like formation enabling the creature to thread even the underground galleries of the field mice.

Being an expert climber, the Weasel preys upon birds, their eggs and young. It can run along the top of a hedge with almost the facility of a bird hopping from twig to twig. Rats and mice are its commonest prey: one bite on the back of the head pierces the brain, which the fierce little

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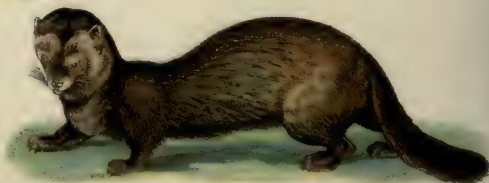
1. Otter



3. Stoat



2. Sable



4. Polecat



5. Marten



6. Weasel



7. Ferret



8. Mink

animal at once devours as a special delicacy. Birds are generally first bitten under the wing, where the great blood-vessels lie. By destroying rodents, especially when it takes up its quarters near hay and corn ricks, the Weasel renders good service to the farmer; and in 1892, when the Lowlands of Scotland suffered from a plague of voles, the Weasels increased in numbers enormously.

As the Weasel breeds at least twice a year and preys upon game birds as big as the pheasant and grouse, the game-keeper makes relentless war upon the miniature tiger, which not infrequently hunts in parties of as many as eight or nine. Small as it is, the Weasel, when incensed, will attack any being which it considers to be an enemy. It has been seen to fly at a cow and hang on her dew-lap because



SKELETON OF THE WEASEL.

(One-fourth natural size.)

she took the liberty of feeding on some grass which grew on the stone-heap in which the Weasel had made its home.

A kite has been known to swoop down upon a foraging Weasel, only to find, when up in the air, that the prospective prey turns to a bloodthirsty aggressor. With the blood-vessels under its wing completely lacerated, the bird gradually sinks back to earth again, while the Weasel remains unhurt to make a meal of the fierce bird of prey. Many instances are recorded where Weasels have even attacked human beings, swarming out of their holes and making a combined assault upon the enemy. In such cases they are most dangerous foes, for they always make for the face and neck, screaming with rage, and biting cruelly with their needle-like teeth. Upon one occasion a farm labourer was beset by half a dozen Weasels, and although armed with a large cart-whip, the man was unable to keep the

fierce little creatures off his body. Not until he secured a stout stake, with which he killed three of his assailants, did the remainder seek safety in the crevices of a neighbouring rock.

The Weasel is capable of being tamed, and is said to be one of the most delightful of pets, cleanly in the extreme, and as playful and inquisitive as any kitten. Most persons, however, would prefer to accept the statement without actually putting it to the test, for the average Weasel is in reality as little likely to modify its nature as is a leopard to change its spots.

STOAT OR ERMINE (*Putorius erminea*).

Coloured Plate IX. Fig. 3.

The Stoat differs from the Weasel only in its greater size and certain distinctive features in the colouring of its coat. It is found throughout Europe and Asia as far south as the Alps and the Himalaya respectively, and also in many parts of North America. It averages about ten and a half inches in length, with a tail of six inches, including the long fur at the tip.

In England the Stoat has a beautiful coat, reddish-brown above and yellowish-white below, while in winter it becomes more or less yellowish-white all over. In very cold regions the fur changes to pure white, except the tip of the tail, which is black. This white-clothed animal is the Ermine, whose fur is in great request.

The Stoat outvies the weasel in its absolute passion for killing for killing's sake. It is the deadly enemy of all small animals; and when it enters a rabbit warren, for example, it ruthlessly destroys all the young ones, even when it is gorged with blood and flesh. Game preservers view the Stoat with positive hatred, and Mr. Westell states that he has seen as many as fifty hanging on one keeper's vermin pole. The reason is not far to seek when one hears of fifty pheasant eggs being found in the retreat of one pair of Stoats. Not one of the eggs was even cracked! In another hole were found a couple of dead but unmutilated

leverets, a brace of young partridges, and a pheasant's egg, together with the heads of two leverets in a state of decomposition. This appears to bear out that the animal is fond of putrefied flesh, and that it hoards up food until it is sufficiently 'high.' The back of the neck or the throat is the spot in its prey which the Stoat seizes, and it will cling to its victim, ravenously sucking its blood, even when it is picked up.

The white coat of the Ermine is the royal fur of England as well as of the sovereigns of Europe. The robes of the Pope and Cardinals of the Church of Rome are also adorned with the fur according to their rank. Edward III. forbade the use of ermine by any persons except those of royal birth. In our country, nowadays, it is officially worn by royalty, the nobility, and judges. The fur is ornamented by the insertion at intervals of the black tails. Royal personages alone wear ermine which is spotted with black in about every square inch, not with tails, but from the paws of the Astrachan lamb. A band of ermine with a single row of spots adorns the royal crown. Rows or bars of the fur in the case of the scarlet robes of peers, and rows of black spots on the ermine capes of peeresses, denote the varying degrees of rank of the wearers. The more common use of ermine is for ladies' muffs, tippets, trimmings, and linings generally.

POLECAT (*Putorius fœtidus*).

Coloured Plate IX. Fig. 4.

The Polecat is common in most parts of Europe, but it is now one of the rarest, as it is the largest, of the British Weasels, surviving only in Scotland, Wales, Exmoor and Dartmoor, and a few of the largest woodlands in the Midlands. Even in the remotest of these districts it is so scarce that very few persons have ever seen one at liberty, and even if they did happen to catch sight of the animal, doubtless they would view it as one of the commoner of the Weasel tribe.

The male is sixteen or seventeen inches long from the

nose to the base of the tail, which is another six or seven inches in length ; the female is four or five inches shorter. The coat of the Polecat is rather handsome ; it is principally dark brown, almost black, the under fur being pale yellow, while the head is marked with black and white. When molested, or irritated, the animal emits an odour that is markedly unpleasant. The fur, too, bears this evil smell, but it disappears during the preparation of the skin for wear.



SKULL OF THE POLECAT.

In disposition the Polecat is ferocious to a degree, destroying any small animal with which it comes in contact. It hunts rabbits with almost incredible fierceness ; a single Polecat will speedily clear a whole warren, for the depredator will kill as many as twenty rabbits at a single visit, and all without a scarcely perceptible wound. A few generations ago the animal was the terror of the farmyard, for if it contrived to break into a hen-roost or pigeon-loft, scarcely a bird could hope to escape beheadal.

The Polecat is an expert swimmer and can catch fish. Eleven eels have been found in a single nest. In movement it is extremely active, and when it runs it arches its back, giving it the sinuous snake-like motion that is characteristic of the gait of the Weasels.

FERRET (*Putorius furo*).

Coloured Plate IX. Fig. 7.

The Ferret, though of African origin, is practically a domesticated variety of the polecat, if an animal which manifests no attachment nor acquires any habits of dependence can be said to be domesticated. The animal was first introduced into Spain, whence it has spread all over Europe. It is whitish or pale yellow in colour and has red eyes ; and in shape and disposition, so far as other

animals are concerned, it is little less bloodthirsty than any of its race. Only can it be said in its favour that it can be handled with safety by persons accustomed to it.

The Ferret is employed to drive rats and rabbits out of their burrows; in the latter case it is generally muzzled, or it would kill and devour the rabbits in their holes instead of driving them out to the rabbit-catcher. But though a useful servant the Ferret is rather a perilous friend, as more than one warrener has found to his regret. A Ferret that escapes from its cage into a fowl or duck pen promptly gives bloodthirsty evidence of the race to which it belongs; and sometimes it has attacked sleeping children, inflicting frightful wounds on the nose, eyes, and lips, which have afterwards ended in death. A man, too, was once aroused from his sleep by a Ferret, which had seized him near the eyebrow. So tenaciously did the creature hold on that the victim was only freed by severing the Ferret's head from its body.

MINK (*Mustela lutreola*).

Coloured Plate IX. Fig. 8.

The Mink is found in the northern regions of both hemispheres, although it is a stranger to Britain. Of several species two only need be mentioned, viz., the European Mink as figured on the plate and the American Mink (*Mustela vison*).

This animal differs considerably in habits from the other species of the genus. It is a kind of water polecat, which spends as much time in the water as it does on land. It feeds on the smaller mammals, but a great deal of its food consists of aquatic creatures—fish, frogs, crayfish, etc. In disposition the Mink is by no means so destructive and voracious as its nearest relations, generally killing only sufficient to meet the demands of its appetite.

The Mink, with a body fifteen to eighteen inches in length, is more stoutly built than the weasels already described. Its fur, generally dark chocolate in colour, is particularly glossy, with the close felting of the under fur

that is specially adapted to resisting water. The fur of the animal is largely used for ladies' cloaks, muffs, and victorines, and as many as a quarter of a million skins have been imported into England in a year.

In America the Mink is often trained to take the place of the ferret, and 'Minkeries,' or Mink farms, have been established, where the animals are reared for the sake of their furs. It is rather remarkable that a similar plan has not been adopted with the sable, for while the skin of the Mink only fetches from ten to fifteen shillings, that of the sable is worth perhaps as many pounds. When the Mink happens to be silver-grey, it takes on added value, six skins making a muff worth as much as twenty-five guineas.

PINE MARTEN (*Mustela martes*).

Coloured Plate IX. Fig. 5.

Of the Martens there are two species, the Pine Marten, as figured in the illustration, and the Beech, or Stone, Marten (*Mustela foina*). The distinguishing feature of the latter is its white throat; it is not a British animal, but is found in Central Europe, extending into Asia as far as Sikkim.

The Pine Marten is found in the northern regions of both hemispheres; in Central Europe often in the same neighbourhood as the Beech Marten; and only to a small extent in the British Isles. The finest of the species are the Martens of Scandinavia, but those of Ireland, in the Wicklow and Mourne mountains in particular, are a very good second.

The body of the Pine Marten, slender and flexible, is about twenty inches in length; the tail is long and bushy. It is an agile, graceful animal, elegantly furred in brown of various shades, while the under fur is beautifully soft and of a rather lighter colour; the throat is yellow. The animal's feet are very cat-like, and between the naked pads are densely furred. When annoyed, the Marten arches its back, erects its hair, and hisses like a cat. The odour of the animal is something like musk, quite unlike the fetid smell of some of its relations.

Squirrels are the favourite prey of the Pine Marten, but none of the smaller animals are rejected, and it does not hesitate to attack and overcome lambs and young fawns. When chased it takes flight in a series of bounding leaps of six or seven feet, generally making for the nearest tree, up which it darts with extraordinary speed. The female often appropriates the nest of a squirrel which she has eaten, wherein to bring up her young ones, or else she makes a nest in the hollow of a tree. Marten skins, especially the Canadian variety, are often cleverly dyed to imitate real sable.

SABLE (*Mustela zibellina*).

Coloured Plate IX. Fig. 2.

Some naturalists rather incline to the belief that the Siberian Sable is but a local variety of the pine marten; but the conical head, larger ears, and bigger and stronger limbs of the former denote a distinct species.

The fur of the Sable is long and fine and a rich dark-brown in colour. Though only a small animal, its skin is worth from three to ten guineas; but the darkest skins, which are considered the best, rarely pass out of Russia. The Lord Mayor, Aldermen, and Sheriffs of London have their official robes lined with Russian Sable, varying in accordance with their respective ranks. In olden times Sable fur was probably of still more value, for a sixteenth century writer says that a bale of forty skins was worth more than a thousand pieces of gold.

Not only is the Sable a rare animal, but it dwells in such inclement localities that none but the hardest hunters can venture upon its chase, especially as its fur is only in best condition in the winter. The creature must not be shot, as the valuable fur would be injured, and it is therefore taken in 'fall-traps,' which kill the animal at once. Like most of the weasels, the Sable is a cunning animal, and not easily enticed into snares; and if the hunter finds one Sable in ten traps, he is well satisfied.

A Sable trap is simple in construction, consisting of a

little staked inclosure, in which is placed the bait, with a log of wood or a big stone overhanging it. The moment the bait is touched, down falls the weight, which kills the intruder at a blow. A hunter will often set a hundred and fifty traps in a line extending for perhaps fifty miles. When he goes to collect his spoils, he often finds that a Wolverine, Arctic Fox, or other hungry carnivore has forestalled him, the first named, in particular, not only eating the captured animals, but artfully annexing the baits from the still fixed traps by taking them from the rear, and thus avoiding the falling log. To add an element of danger to the injury, the greedy beast not infrequently discovers the hunter's *cache*, or provision store. It will eat every bit of animal food, such as beef, pork, bacon, and venison; and other food, as flour, oatmeal, &c., it will scatter about in the snow, thus leaving the trapper foodless in a region where the thermometer registers many degrees below zero.

GLUTTON (*Gulo luscus*).

Coloured Plate X. Fig. 4.

The Glutton, as it is called in Europe, and Wolverine in America, the largest of the Weasel group, is not at all unlike a small bear. It is found in the northern regions of both the Old and the New World. Its bulky body is nearly three feet long, exclusive of the thick, bushy tail. The fur is long and of a fine, deep chestnut colour, with a dark saddle on the back; its sides are a pale reddish-brown.

The feet are large and hairy and furnished with strong, curved claws. The motion of the animal is slow and clumsy, semi-plantigrade, and altogether in marked contrast to the movements of the true Weasels, which are Digitigrades. It is often stated that the Wolverine climbs trees, from which it leaps to the throats of animals as big as the Reindeer, whereas the animal is not at all a good climber.

The Glutton is sufficiently bad in character without

resorting to exaggeration. It is notoriously powerful, and its strength is fittingly matched by its undoubted cunning; and were its size only proportionate to its voracious appetite, it would be one of the most formidable of the Carnivora.

It has already been told how the marten and sable trapper is often literally plagued to death by the Wolverine's artful depredations. A well-known skilful trapper relates how one of the animals depleted his traps time after time, until he determined to devote his energies to catching the marauder. He set nine traps for three weeks, but while the cunning creature carefully avoided them, it still stole the baits and any captured animals that were in the simpler marten snares. The trapper next set a spring gun, only to find that the Wolverine gnawed through the string which connected the trigger with the bait, which it then carried away without fear of injury. Three times this occurred, and then the trapper gave up the task in despair, trusting to find another 'marten-round' where he would be free from the unwelcome attentions of this particular animal.

The fur of the Glutton or Wolverine is valuable, and when a trapper can catch his inveterate enemy, there is some consolation in receiving a good price for the pelt of an animal that has perhaps deprived him of scores of marten skins.

Sub-Family Melinæ.

BADGER (*Meles taxus*).

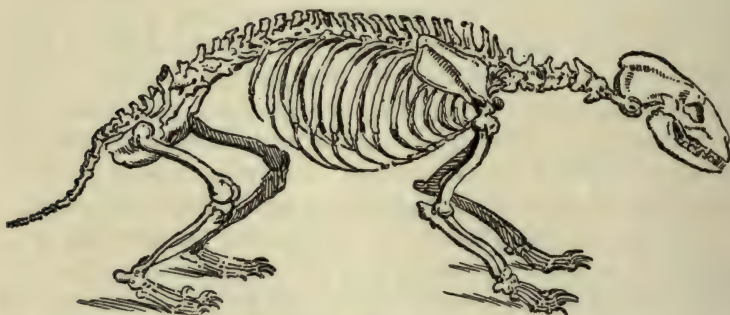
Coloured Plate X. Fig. 5.

The common Badger is the largest of the indigenous Carnivora of our own country, for though it is shorter in the body than the fox, and only one foot high at the shoulder, its stout, broad body is of rather clumsy build. One of the heaviest known specimens turned the scale at forty-two pounds.

Like the wolverene, the Badger is only semi-plantigrade, the heel being slightly raised from the ground. Its long

feet have straight toes with curved but rather blunt, non-retractile claws, with which the animal burrows with wonderful rapidity. In common with various animals of the family, the Badger can easily walk or trot backwards. The hair is reddish or yellowish grey, the lower parts being darker, and the head black and white.

Found throughout the northern parts of Europe, Asia, and America, the Badger is still fairly common in many parts of the British Islands. It is a perfectly harmless animal until provoked to defend itself; its bite is particularly powerful, and the jaws so lock together that their hold is difficult to shake off. Shy, wary, and nocturnal, the



SKELETON OF THE BADGER.

Badger is practically omnivorous, living upon small animals, insects, frogs, roots, fruits, &c.

The Badger's burrow is very deep and winding, and in it is placed a warm nest of dried grasses and bracken. In this the three or four young ones are born at the end of March, but they do not come out into the open until June. Very often several burrows are quite close to each other, and it is nothing uncommon for the female Badger to make her nest in a fox earth, even while part of it is tenanted by its original owner.

Like the generality of weasels, the Badger possesses offensive glands, the nature of which is denoted in Burns's poetical allusion to the 'stinking Brock.' Contrary to general opinion, the Badger, when at liberty, is scrupulously clean in its ways. A gentleman who captured a young

Badger in Bulgaria speaks quite enthusiastically of its good qualities :—

‘He lived with us for years, and I am able to give him an excellent character. There is a saying, “smells like a Badger.” This is a shameful libel on the cleanest beast I know. It is only when shut up in some small place that he becomes objectionable, and I am sure that, much as man dislikes the smell, the Badger likes it less. The greyhounds soon made friends with him, and long before he was fully grown he was their master, and could roll them over with the greatest ease. He was omnivorous, but the treat of his life was a lump of sugar, or, better still, a little honey. He slept under my bed all the time we were in the tent, and would follow me almost like a dog.’

Badger-baiting was at one time a very popular sport in England. Even nowadays the discovery of one of the animals is the occasion for much barbarous treatment. Though naturally harmless and rather slothful, scarcely any animal can defend itself so obstinately, or inflict keener wounds on its adversaries. Its skin is thick and loose, permitting it, even when seized, to turn round upon its assailants. Not infrequently the unfortunate beast will endure torture throughout a whole day, maintaining the unequal fight until, worn out by wounds and continual reinforcement of its enemies, it is drawn from its hole and forced to submit.

The skin of the Badger, dressed with the hair on, is manufactured into pistol-cases, and is often used for covering travelling trunks; the long hairs are used for making shaving-brushes and painters’ pencils. In Italy and France the hindquarters of the animal are cured like hams, and are said to be superior to the flesh of the hog.

The American Badger (*Taxidea americana*) is larger than the European species. In some portions of the United States the animal is so numerous that the burrows render travelling on horseback dangerous.

The Cape Zorilla (*Ictonyx zorilla*), or Cape Polecat, is often tamed for ferreting purposes. It is striped something like the American skunk, to which it is only second in evil-smelling qualities.

SKUNK (*Mephitis varians*).

Coloured Plate X. Fig. 2.

Although, as we have seen, the badger does not possess the vile odour with which it has been credited, there is a North American weasel which surpasses all power of description in this respect. This is the Skunk, which has the power, when alarmed, of ejecting with some force a secretion which none but a Skunk can endure. The fiery liquid is discharged from two teats under the tail, which have a range of twelve feet. The odour is so persistent that if a spot of the fluid should drop upon the dress no amount of washing suffices to purify it. If it come in contact with the skin the whole system is affected, and the victim is nauseated until he would welcome sea-sickness as an agreeable exchange. Audubon declared that the spot where an animal was killed in the autumn still retained the foul odour when the snow melted in the following spring.

Dr. Coues states that the evil-smelling secretion has been recommended as a cure for asthma. A story is told of an afflicted public speaker who used a smelling-bottle in which was the loathsome gland of a Skunk. In a moment of forgetfulness he uncorked the bottle while on the platform, with the result that the audience incontinently fled, gasping for breath, into the street.

The Skunk is to be feared for another reason. When hunters are camping out it is apt to gnaw their hands while they sleep, in most cases causing death by hydrophobia.

The animal figured in the illustration is a North American species; its length is about eighteen inches, exclusive of the tail. It is a very handsomely clothed creature, the soft fur being generally dark brown or black, with two white stripes running from the head to the tail, which is an elegant appendage.

Skunk fur is rid of its offensive odour by being subjected to great heat. If the carcass of the animal is unsoiled by the secretion, the flesh is at least eatable. The natives consider it excellent, but the white man views it with considerable suspicion.

The skunk is quite weasel-like in build, but the Teledu (*Mydaus meliceps*) is of stouter build and more generally resembles the badger. It is a native of Java. In size it is about equal to the skunk, though its shorter hair and stumpy tail give the impression that it is much smaller. It is a confirmed burrower, and when it makes its way into gardens and plantations it works much damage. The land-owner almost cheerfully suffers this injury rather than eject the creature and thus give rise to an intolerable stench, almost as vile in character as that emitted by the skunk.

Sub-Family Lutrinae.

OTTER (*Lutra vulgaris*).

Coloured Plate IX. Fig. 1.

The Otters, while quite active on land, are only thoroughly at home when in the water; yet in order to conform them to an aquatic life there is little change in their structure beyond the webbing of the toes, the shortening and flattening of the head, and the horizontal flattening of the tail into a very serviceable rudder.

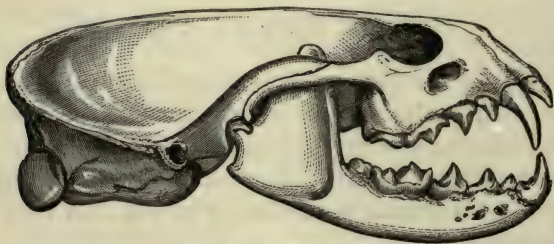
The Common Otter is one of the largest and certainly one of the most attractive of the British Carnivora; and it is more common than is generally supposed where fish are abundant. Very often the animal travels considerable distances from river to river, incidentally straying into special trout pools and fish-breeding ponds, to its own satisfaction and correspondingly to the chagrin of the owner. When the supply of fish fails it will prey upon birds, small animals, poultry, and even young lambs and pigs.

The Otter is about a yard in length, of which the tail forms one-third. The legs are short and the five toes are webbed and fitted with blunt claws; the feet are so placed that they can almost perform the action of fins. The eyes of the animal are placed nearer the nose than in most other animals, allowing it easily to see upwards, for which reason the Otter generally pursues its prey from the

bottom. The fur of the animal consists of a short, close waterproof vest of a light grey colour, and a long, silky, shining upper coat of a rich brown tint.

Fierce, wild, and shy, the Otter is chiefly nocturnal in habit; its retreat is generally a burrow by the water's edge, extending to some distance under the bank, and concealed by overhanging brushwood, tangled briers, and herbage, or by the roots of an old tree.

Otter-hunting is still a favourite so-called sport in several districts. The moment the animal is discovered it betakes itself to the water, where it is more than a match for the strongest dog. Wearied out by its exertions to escape its foes, assailed on every side, covered with wounds, and prodded with poles as it rises to breathe, still the Otter's



SKULL OF THE OTTER.

(Two-thirds natural size.)

determined courage holds out to the last, and it dies without uttering a cry. It requires no little skill on the part of the hunters to effect the capture, for the Otter knows every hole, drain, or other place of refuge within several miles, and never sleeps twice in the same place. One animal, which had long baffled the hounds and hunters, actually made its hiding-place inside the wheel of a water-mill.

An Otter-worry from first to last is a particularly odious and cruel business that causes a lover of animals to be ashamed of his kind. In a fox-hunt the quarry is afforded an opportunity to escape from its foes—the pack is in the rear and an open countryside lies in front, wherein the fox can exercise its feet and its cunning to outwit its pursuers. The chase of the poor Otter resolves itself into cowardly persecution, pure and simple. Before the wretched hunt

really begins all hope of escape is cut off by a cordon of hounds and waders who block the stream above and below. The worry itself is a series of acts of cowardice and cruelty that would shame savages.

To see the Otter in perfection, two or three of the animals ought to be in a playful mood, enjoying a skirmish in the water, 'rolling and diving, and twisting and wrestling, and cuddling and kissing, and biting and scratching, in the most charming fashion that ever was seen.' The Otter chiefly hunts the water at night, but daylight is no bar to the satisfaction of its appetite. In December, 1908, at Middletown, in Ireland, there was a tremendous fight between a great pike and an Otter in the local canal. The pair repeatedly rose to the surface and dived again, the water being coloured with blood. Finally, the Otter, which lost an ear in the struggle, killed the pike and dragged it ashore, where the victor was shot by an onlooker. The fish weighed twenty-three pounds, very little short of the weight of the finest specimens of British dog Otters.

The Otter is far from being destitute of intelligence and docility; it may be easily tamed, and has indeed been frequently kept in a state of domestication. Bewick tells of a Scotsman who employed one very successfully in salmon-fishing, the animal sometimes taking nine or ten fish in a day. It followed its master like a dog, and displayed great confidence and attachment. The chief objection to the Otter in a wild state is that, when prey is plentiful, it becomes exceedingly dainty, and after bringing a salmon ashore will merely bite a piece from the shoulder, leave the fish on the bank, and go after another. The Scotch shepherds who are stationed near salmon streams find the Otter one of their best friends, as it keeps them supplied with fish season after season.

In some parts of the world the Otter is quite extensively tamed, and taught to catch fish for its master. The Chinese and the Hindoos are great adepts at this art. Bishop Heber mentions in his journal that when passing near a river he saw nearly a dozen Otters lying on the banks, tethered with straw collars and long ropes. They were

of great assistance to their masters, driving the shoals of fish into the nets, and then bringing out the largest in their teeth. The good Bishop sensibly remarks that 'the simple Hindoo shows here a better taste and judgment than half the Otter-hunting and badger-baiting gentry of England.'

SEA OTTER (*Enhydra marina*).

The Sea Otter is a larger animal than its fresh-water cousin, attaining a length of four or five feet, including the tail, and weighing as much as seventy or eighty pounds. In its strong, blunt teeth the grinders do not present any cutting edges, as in most animals of the Carnivora, but the surface of each is raised into little eminences that prove exceedingly useful in breaking up shell-fish, &c. There is also a difference in the hind feet, which are long and flipper-like, each with a surface of about twenty-four square inches, similar to those of the seal.

The fur is soft, thick, and velvety; it is brownish-black in colour, with long stiff hairs, grizzled at the tips, which assist to give the whole coat a hoar-frosted appearance. The Sea Otter is gregarious, often being found in bands numbering hundreds of animals. When undisturbed they spend a great deal of time floating or swimming on their backs; they frequently devour prey in this attitude; and the female thus supports her young one on her chest, even while she is asleep. The flesh of the young Otter is considered a delicacy, and is said to be not unlike lamb in flavour.

The Sea Otter never was a very common animal, not even in its particular habitat, the eastern and western shores of the North Pacific Ocean, from Alaska to California, and from Kamschatka to the Yellow Sea. As a good Otter skin is valued at £40, there is little wonder that the creature is remorselessly hunted.

Formerly the Otter was either speared or clubbed. In the first case a number of boats, each manned by a couple of men, would be engaged in the pursuit of an animal. Whenever it came up to breathe it was forced instantly to dive again, repeating the operation until the

Plate X.



1. Kinkajou



2. Skunk



3. Coati



4. Glutton



5. Badger



6. Raccoon

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Otter could dive no longer, when it was speared and drawn into the boat. Clubbing was a winter method. During the frequent gales the Otters, to avoid the wind, often bury their heads in the sea kelp near to the outlying rocks. Under cover of the noise of the storm the hunters were enabled to despatch one animal after another without disturbing the main body. In this manner two men have been known to slay as many as eighty Otters in a couple of hours.

Nowadays the rifle is the chief means employed to capture the Sea Otter, and as the head offers a fair mark even at a distance of a thousand yards, it is a far easier method than the old style. The Otter rifleman plies his business throughout the year, and consequently there is little wonder that Sea Otter skins get fewer and fewer each season.

FAMILY PROCYONIDÆ.

RACCOON (*Procyon lotor*).

Coloured Plate X. Fig. 6.

Though in appearance animals of the Raccoon type differ from each other very considerably, they are all distant cousins to the bears, from which they are chiefly distinguished by their inferior size and the possession of two true molar teeth on each side of the jaw.

The Raccoon of North America ranges from British Columbia to Paraguay. It derives its specific name of *lotor* or 'washer' in consequence of its habit of rinsing its food in water before eating it. A female Raccoon in the Zoological Gardens washed her kittens so frequently that they died from the effects of their mother's mistaken zeal.

The animal is arboreal and nocturnal in habit, climbing trees with great facility, and sleeping in the hollows of trunks. It is a restless, prying creature, and when tamed is an interesting, if mischievous, pet. In body it is short and

stout, and generally about the size of a fox. The general colour is blackish grey, and the bushy tail is ringed with bands of black hair. Its food is extremely varied, ranging from vegetable to animal, as occasion serves. It is rather apt to invade hen-roosts, but otherwise does little harm. The fur is valuable and makes very handsome carriage rugs, and the flesh is peculiarly good to eat.

A 'Coon hunt used to be one of the favourite amusements of the negroes when slavery was still practised in the United States. When the animal lives near the coast it adds oysters, mussels, and crabs to its diet. To catch the last named the Raccoon hangs its tail just on the surface of the water. As soon as the crab grips it in mistake for food, the animal whisks it out of the water, and then, seizing it from behind, greedily devours its prey.

COAITI (*Nasua rufa*).

Coloured Plate X. Fig. 3.

The Coaiti-mondi is a native of South America. The generic name of *nasua* signifies 'nosy,' and a glance at the illustration will show the great length and extraordinary mobility of the snout, which by no means adds to the animal's beauty.

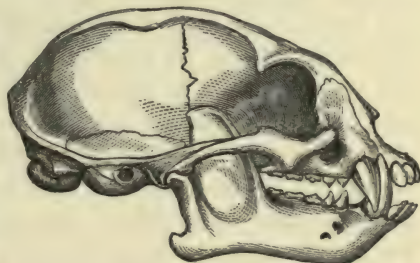
The covering of the Red Coaiti is short and reddish-brown in colour, and the thick tail is ringed with black and brownish-yellow. The animal is longer in the body than the Raccoon; but with its short limbs, and the inquisitive manner in which it continually turns its snout in all directions, it is not nearly so attractive. Like the Raccoon, the Coaiti is a great tree-climber, and, indeed, is almost equal to the monkey in that respect. It is nocturnal in its habits, sleeping during the day, with its bushy tail curled over its long nose. When hunted it fights desperately, and it behoves one to avoid its double-edged canine teeth.

Another species of Coaiti, called the Quasje (*Nasua nasica*), is a Central American animal, differing in no important respect from the foregoing, except that there is no red tint in its coat.

KINKAJOU (*Cercoleptes caudivolvulus*).

Coloured Plate X. Fig. 1.

The Kinkajou derives its name from two words, Greek and Latin respectively, both of which mean 'twisted tail,' given to the lovely furry creature in allusion to its prehensile appendage, which is nearly as flexible as that of the spider monkey. The earlier naturalists classed the Kinkajou among the Lemurs. Though it has no opposable thumb and the fingers are webbed very nearly to the claws, the animal holds food in one hand, breaking pieces off with the other in a manner almost human. The tongue is extremely long and flexible, the owner using it for the purpose of extracting insects from the crevices in which they are lurking. When asleep it rolls itself into a ball. It will also sit demurely on its hind legs like a Scotch terrier.



SKULL OF THE KINKAJOU.

(Two-thirds natural size.)

There are other members of the raccoon family that deserve brief mention. The Cacomistle (*Bassaris astuta*) of California, Texas, and Mexico is often called the Ring-tailed Cat. Miners, in particular, capture the animal and tame it, and in a mining camp a mousing Cacomistle will always fetch a good price.

The Panda (*Ælurus fulgens*), whose generic name means 'waving tail,' is another beautiful cat-like creature, mostly found in the Eastern Himalaya. Its coat is a rich red chestnut, darkening into jet black on the under parts, another example of the converse to the general rule. It is a pity that the beautifully coloured animal does not exist in sufficient numbers to render its fur a more common article of commerce.

FAMILY URSIDÆ (BEARS).

The Ursine family (Lat., *ursus*, a bear) consists of bulky animals with thick fur, the largest beasts of prey in the Northern Hemisphere. All of them are plantigrade and markedly deliberate in gait. On each foot are five toes, furnished with strong curved claws. Though the claws are often five inches long over the outside curve, being non-retractile they get worn down at their tips through coming into contact with the ground; thus in conflict with another thickly-haired animal a Bear can inflict but little injury. Most of the Bears are admirable climbers of trees, and some species seem to pass most part of their existence among the branches.

The Bears possess the teeth of the true carnivores, differing technically from their nearest relations only by having two molar teeth on each side of the upper and three in the lower jaw. The canine teeth are large and strong, but not nearly so prominent as in the cat and dog tribes. There is a marked difference in the jaws from those of the Carnivora generally. The Bear's jaws are not limited to a scissor-blade movement; it can work them from side to side, and chew to a pulp roots, &c., which it could not possibly swallow whole. Except in the case of one species, Bears are not strictly carnivorous, for in addition to animal food they eat largely of roots and fruits, and in particular they are fond of honey; but even the Polar Bear, whose diet is chiefly animal food, and the Sloth Bear, which is a vegetarian, have exactly the same kind of teeth and similar jaw movement.

In cold regions, from October to March some of the female Bears hibernate in hollow trees, caves, or collections of branches and moss, during which time birth is given to the young; the males and younger females do not take an unbroken rest. Though most Bears do not, as a rule, molest human beings, it is best to give them a wide berth when, gaunt and hungry, they wake up from their long fast.

Compared to the cats the Bears are clumsy and shuffling in movement, their coats are more sombre, and in teeth,

claws, muscularity and agility, there is an all-round inferiority. Nor have the Bears so wide a range as the Felidæ, for though they are found in both hemispheres, there are vast regions from which they are excluded. They are unknown in Africa, south of the Sahara, and are absent from not only the true Australasian regions, but also from many of the islands of the south-east of Asia, where various members of the cat tribe abound.

BROWN BEAR (*Ursus arctos*).

Coloured Plate XI. Fig. 1.

The Brown Bear is not only the commonest, but is the most typical species of the whole tribe. Its range extends throughout almost the whole of Europe, particularly Russia, Scandinavia, Central Europe, the Pyrenees, and the Balkan Peninsula; in Asia it is found throughout Siberia to the shores of the Pacific; and it also inhabits the colder regions of North America.

There is not the slightest doubt that this Bear at one time existed in Britain, for the Romans exported the beast to fight in the arena. The citizens of Norwich sent annually to Edward the Confessor a Bear and six dogs with which to bait it; and there is rather a shadowy record that one of the Gordon family killed a fierce animal in Scotland in 1057. Bear-baiting and whipping the blinded Bear were considered sports sufficiently refined to please Queen Elizabeth; but there is reason to believe that by that time the Bear had been exterminated in Britain, and that animals were imported from the Continent to make sport for British holiday crowds.

The Brown Bear is the largest of the European Carnivora, if we except the Polar Bear, which is found in the frozen regions of the extreme north. In length from five to seven feet, and standing about three and a half feet high at the shoulder, the Bear, with its long and shaggy dark brown coat and shambling gait, is an uncouth-looking brute.

Not only are the Bears plantigrade, but the lower surface of the foot is so large that when they fight they stand nearly

erect upon the hind feet and strike with the armed fore paws. The power of the Bear's stroke is terrible, and is the more to be dreaded because it is as quick as it is strong. No trained boxer can deliver a blow more swift or more true than that of the Bear. Many writers assert that it clasps its antagonist in its arms, and squeezes him with such force that it drives all the breath out of his body. It is almost useless to attack a Bear with a club or the stock of a rifle. The Bear wards off the blows with perfect ease, strikes the weapon out of the hands of its assailant, and then closes to claw and bite rather than hug him.

In food most Bears are omnivorous, and are exceedingly fond of fruit ; and, as Mr. Lloyd, a well-known Bear-hunter, tells us of the Brown Bear, 'he feeds on roots and the leaves and small limbs of the aspen, mountain ash, and other trees. He is also fond of succulent plants, such as the mountain thistle, &c., and partial to many berries common to the Scandinavian forests. Ripe corn he also eats, and sometimes commits no small havoc among it ; for, seating himself on his haunches in a field of it, he collects in his outstretched arms nearly a sheaf at a time, the ears of which he then devours.'

Cattle-owners have but little fear of the Bear, for it much prefers vegetable food—varied occasionally with wasp and bee grubs—to the flesh of animals ; but now and then a Bear does take to cattle-killing, and then becomes the terror of the neighbourhood, and must be destroyed. The usual mode of killing the Bear in Scandinavia is by a *skall*, i.e., by finding its den, surrounding the spot with a large body of armed men, and then closing upon the animal from all sides. The flesh of the Bear being very good to eat, and its skin always fetching a high price, a successful *skall* repays the hunters for their trouble. Bears' paws are considered a great delicacy, and after being salted and smoked were often reserved for the tables of princes in Germany. Occasionally Bear's flesh is obtainable in London, where it is eaten chiefly out of curiosity.

The Bears of Russia in particular are of great size, and in winter their coats are in magnificent condition, and are in great request among Russian nobles for warm sledge rugs.

PLATE XVI.



GRIZZLY BEAR.

THE
MUSEUM
OF
NATURAL
HISTORY

PLATE XVII.



1. MALAYAN BEAR.

2. SLOTH BEAR.

(See page 188)

(Photos W. S. Berridge, F.Z.S.)

Some of the finest skins obtainable are used for making the caps of our Grenadier and Coldstream Guards.

The Bear swims well and fast, and is fond of bathing in the heat of summer ; its climbing powers are well known : all who have visited the Gardens of the Zoological Society have witnessed the feat of mounting the pole for the tempting morsel proffered as a reward. In descending a tree or precipice it always comes down backwards, much resembling a human being in its actions and cautious mode of proceeding.

The Brown Bear, when caught young, is rather easily tamed, but its temper is always uncertain ; and sometimes without preliminary warning it will ferociously bite any one with whom it has hitherto been on friendly terms. The so-called dancing Bears sometimes seen in our streets were formerly chiefly the Alpine variety, but, the Swiss supply failing, nowadays most of the animals come from the Pyrenees or Roumania.

The American Brown Bear, distinct altogether from the Grizzly, is still larger than the Russian, and especially is this the case in Alaska. A skin of nine feet across the shoulders, and requiring two men to carry it, is by no means a rarity.

GRIZZLY BEAR (*Ursus ferox*).

Plate XVI.

The Grizzly Bear, now found only in the Northern Rockies, is the most formidable animal of the North American Continent, as it is the most ferocious of the Bear tribe. It commonly grows to a length of eight or nine feet, with an average weight of about eight hundred pounds. Sir Samuel Baker asserted that the commoner Brown Bear is often mistaken for the Grizzly, which latter may weigh anything up to fourteen hundred pounds, which is about the weight of an English cart-horse ; and of all the Bears the real Grizzly, or 'Old Ephraim,' is the most dreaded.

The more correct title is 'Grisly' in reference to its ferocious character, rather than one applied to the coat of

brown hair grizzled with white; its feet and paws are enormous, with claws six inches in length. Its strength may be gauged from its ability to drag to a considerable distance the carcass of a buffalo weighing not much less than half a ton.

The Grizzly has no liking for vegetable food so long as flesh is obtainable, and its ferocious disposition leads it to attack man, when other species would use all their energies in taking to flight. To its savage nature this Bear adds a tenacity of life that makes it a doubly dangerous foe. It has been known to receive five balls actually through the lungs, and five others in different parts of the body, and yet be left with sufficient vitality to chase a couple of hunters into a river, where, fortunately, a shot from a third man on the bank penetrated the brain, just as the infuriated animal was about to seize one of its enemies.

Hunters in the Rockies tell of marvellous escapes from death when at close quarters with the Grizzly. More than once men have saved their lives at a critical moment by feigning death, when an enraged animal would cease to maul them. One trapper, who had been stunned, awoke to the fact that he was 'dead and buried.' It is characteristic of the Bear to store surplus food, and during the man's unconsciousness the huge beast had scratched out a shallow hole, into which it tumbled the body and lightly covered it with mould and leaves. When the Bear later in the day returned to dine at its leisure, the prospective meal had recovered his rifle, and from a safe spot was enabled to turn the tables on 'Old Ephraim.'

SYRIAN BEAR (*Ursus syriacus*).

Another variety of the Brown Bear and the oldest of which we have historical record, is the Syrian Bear, found in various parts of Western Asia. Judging from the frequent references to the Bear in Scripture, in Biblical times it was probably common where now it is very rare. The native haunt of the Syrian Bear to-day is only the remote fastnesses of the wooded heights of Hermon and Lebanon. It is narrated that David had to defend his

flocks against this Bear, and again that 'there came forth two she-Bears out of a wood and tare forty and two of them,' when the children of Bethel mocked at Elisha. There is now practically no timber in Judæa, and with the gradual destruction of its shelter the Bear has retreated further east of the Jordan.

Several times in the Scriptures the Bear's ferocity when deprived of its young is used as a simile, *e.g.*, 'Let a Bear robbed of her whelps meet a man, rather than a fool in his folly' (Prov. xvii. 12). A female Bear guarding her young is a most dangerous animal; she will fight to the death on their behalf, and in her expiring moments her sole concern is wrapped up in the safety of her progeny.

The Syrian Bear is not a large animal, little more than a third of the size which the common Brown Bear sometimes attains. Its chief depredations are confined to stealing corn, apples, and grapes from the vineyards.

POLAR BEAR (*Ursus maritimus*).

Coloured Plate XI. Fig. 2.

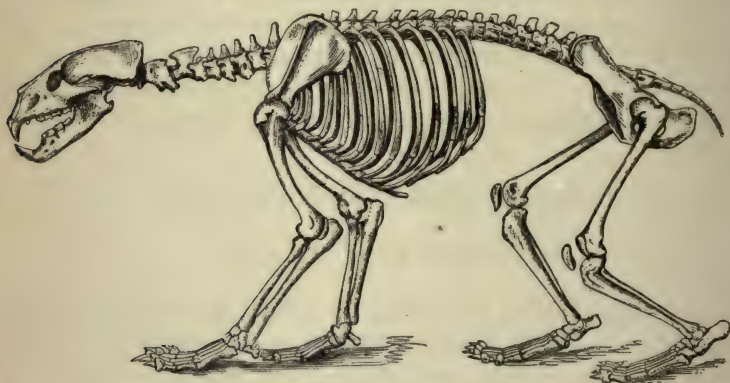
The Polar Bear, Ice Bear, or White Bear, is so called from the region it inhabits, or the creamy yellowish fur of its coat. It is found on the desolate shores of the Arctic Ocean in both hemispheres; and it is one of the few animals that make no attempt by migration to escape the rigours of the terrible winter. It is found sometimes in Iceland, but only when it has reached the island on a berg or drifting ice.

Though not so bulky as the grizzly, the Polar Bear is longer in the body. The animal is a mighty swimmer; it is as light as a cork, and the broad feet make excellent paddles. Upon occasions it is seen swimming eighty miles from land, with not so much as an icefloe in sight; and at other times it will drift hundreds of miles on iceberg or floe, feeding upon the seals around it.

As it lives among ice, and often has to capture the seal, or even the walrus, as the prey lies upon a glassy surface, the under surface of the paws is covered with a dense

coating of hair, so that it can traverse the ice without slipping, while its footsteps are absolutely noiseless.

The Polar Bear has a very remarkable way of attacking the walrus. Now, it must be remembered that the walrus is nearly equal in bulk to a small elephant, weighing something in the neighbourhood of a ton, and is, moreover, armed with a pair of terrible tusks. The usual mode of attack is for the Bear to creep up behind a sleeping walrus, and then to spring on its shoulders, maintain its hold with one paw, and with the other to deal such terrific blows at the marine mammal's head that the skull is fractured before the animal can gain the water. Should the prey succeed in



SKELETON OF THE POLAR BEAR.

(About one-eighteenth natural size.)

reaching water, the walrus has the best of the battle, as it dives to depths which are too great for the endurance of the Bear, and thus rids itself of its foe.

In stalking seals, or even man, the huge carnivore exhibits the greatest cunning, taking care to hide its black muzzle, which is the only part of its body likely to show against its frozen surroundings. In capturing seals it is remarkably adept, diving under a floe and appearing at the hole, which is the only retreat open to the easily alarmed prey.

The Polar Bear grows to an immense size, sometimes attaining a length of thirteen feet. One, which measured

THE
OF
CATHOLIC



1. Brown Bear



2. Polar Bear

seven feet eight inches in length, weighed over eleven hundred pounds. The skin of this animal was placed in the national collection. Another, which measured nearly a foot longer, weighed sixteen hundred pounds. And the Bear's strength is in proportion to its size, or it could not, for example, hoist a dead walrus out of the water on to the ice, there to enjoy a leisured repast.

A White Bear at bay is an exceedingly dangerous animal, for, unlike its more sombre-clothed cousins, it does not attempt to hug the foe, but furiously bites and claws at every opportunity. If there are two hunters opposed to the animal, it is comparatively easy to overcome it, since when it turns with its upraised arms to counter the assault of one, it exposes its other side to the second hunter, who is able to inflict a death-wound.

If the hunter be alone, he recognises the harder task, but does not hesitate. He first provokes the animal, and then runs as if to escape, knowing that the Bear will pursue him. With a rapid jump the hunter suddenly doubles on his track, and the exasperated beast in the act of turning is pierced with a lance below the shoulder. Unless the thrust is a dexterous one, inflicting vital injury, the hunter has to leave his spear in the side of his prey and seek his own safety in flight, about which there is then no pretence. But, aided by his dogs, the hunter seldom fails to overcome his huge adversary.

The flesh of the Polar Bear is not in such good repute as that of the brown species. Arctic explorers assert that some portions of the body are poisonous, and sailors have certainly fallen ill after partaking of it. The Bear is a notoriously foul feeder—fish, flesh, or fowl, living or dead, fresh or putrid, nothing is rejected. When whaling was more followed than it is nowadays, the Bear had greater opportunities of gorging on decaying offal which the whalers left in their track, and in all probability a prolonged diet of putrid food had more than a little to do with the unwholesomeness of the Bear's own flesh.

The Polar Bear is by no means hard to keep in captivity in England, notwithstanding the inability to provide it with anything like its accustomed environment. One animal

lived at the Zoo for over thirty years. In November, 1908, a young Polar Bear was born in Regent's Park, the first since 1866, when an animal was born and died the same day. This tiny fluffy new arrival was about the size of a kitten. In a natural state the White Bear has the reputation of being a most devoted mother; but the one in captivity made no attempt to sustain the character of her tribe. The little one was born at 9 a.m., and the only notice the mother took of it was to pick it up by the neck or leg and then drop it heavily on to the hard concrete floor of the den. It was rescued at the end of three-quarters of an hour only just in time to avoid its immediate death from cold and exposure. A retriever foster-mother was obtained for the little creature, but all to no purpose, for it lived only a few hours longer.

In addition to the foregoing there are various species of the Bear family. The Black Bear (*Ursus americanus*) is the smallest of the American Bears and is practically harmless, except that it frequently ravages the maize-fields. The Malayan Bear (*Ursus malayanus*), Plate XVII. Fig. 1, of the Malay Peninsula and neighbouring islands, is a great honey-eater, and, in addition, does much damage in the cocoa plantations. The Spectacled Bear (*Ursus ornatus*) of South America is a black-coated animal with dirty yellow rings around its eyes.

The Indian Sloth Bear (*Melursus ursinus*), Plate XVII. Fig. 2, is a rough, clumsy animal with an elongated muzzle and remarkably mobile lips, which it protrudes and retracts with wonderful facility. This modification of the mouth enables the creature to pick up ants and grubs. Although it only weighs from two to three hundred pounds it is a formidable little beast; and Sir Samuel Baker was of opinion that it caused more accidents to Indian natives than any other animal. Major C. S. Cumberland says that, when wounded, the Sloth Bear 'is a perfect fiend, rushing about hither and thither, clawing and biting anything he comes against, yelling and roaring all the time.' This Bear often raids the natives' palm-juice vessels, with the result that it retires to its den in a sad state of intoxication.

Chapter VII

ORDER IV.—CARNIVORA (*continued*)

SUB-ORDER 2.—CARNIVORA OF THE SEA

General description of the Pinnipedia—Common Seal—Grey Seal—Bladder-nose or Crested Seal—Greenland Seal—Sea Leopard—Sea Elephant—Sea Lion—Sea Bear or Northern Fur Seal—Walrus.

CHAPTER VII

Order IV.—Carnivora (*continued*)

Sub-Order 2.—CARNIVORA OF THE SEA

PASSING from the Carnivora of the land to those of the sea, we come to the Pinnipedia (Lat., *pinna*, a fin ; *pes*, *pedis*, a foot), the fin-footed animals, or Seals, which include the Sea Lions and the Walrus. Various other marine carnivores (Cetacea) form an order of their own.

Before describing the life-history of any particular member of the sub-order, it will be well to examine the skeleton of the Seal, and note how, by certain modifications of the bones, the mammal practically becomes a fish, just as in the Bats it is in reality transformed into a bird.

The name Pinnipedia is very appropriate, as is the alternative name Pinnigrada (Lat., *pinna*, a fin ; *gradus*, a step). The limbs are shortened, and are so arranged that they act exactly like the pectoral fins and tail of a fish. The hind limbs, especially, are directed backwards, and the bones are so modified that, when the feet are pressed together, they can be swept from side to side as if they were the tail fin of a fish. Indeed, as the Seal feeds on fish, as does the otter, it is necessary that it should be swifter than its prey. In the otter the tail is the propelling organ ; but in the Seal the hind limbs are used in tail fashion.

In the water the movements of the Seal are extremely graceful and rapid, but on land its motions are exceedingly awkward. The limbs, even the fore ones, are practically of no service. The spine is furnished with specially strong

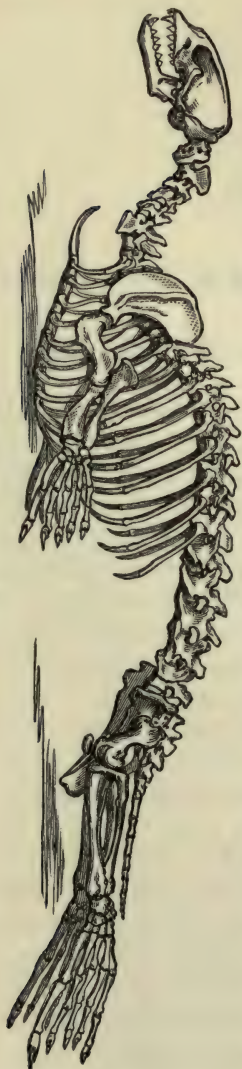
muscles, by means of which the body is contracted and thrown forward by a succession of ungainly jerks.

Naturalists have arranged the Seals in various technical divisions. Traders adopt a simpler classification, dividing the diverse varieties into Hair Seals, Fur Seals, and the Walrus, the first-named being of service for their hides and oil, the second supplying skins from which are made the 'sealskin' garments that are so highly prized. To economise space and the reader's patience only a few of the more notable typical examples will be offered for consideration.

Scientifically the Seals may be roughly divided into the Phocidæ, or true Seals; the Otariidæ, or Eared Seals; and the Trichechidæ, or Walrus, of which only one species is in existence. These groups may be easily distinguished. The Phocidæ have no external ears; the Otariidæ have small pointed ears; and the Walrus has two enormous tusks projecting from the upper jaw.

One peculiarity in all the Seals is worthy of notice. The nostrils are surrounded by a muscle, called a sphincter, *i.e.*, a constrictor, by which the nostrils are kept closed until required, when they can be opened while the creature breathes, closing again automatically, without any exertion on the part of the animal. The object of this structure is to prevent water passing into the lungs while the Seal is below the surface. When we come to the Whales, we shall find that the same

SKELETON OF THE SEAL.



object is attained by means of a self-acting valve. On land the respiration of the seal is slow—two minutes between each breath; the animal can remain under water for twenty-five minutes.

FAMILY PHOCIDÆ.

COMMON SEAL (*Phoca vitulina*).

Coloured Plate XII. Fig. 3.

Of the Earless, or True Seals, the Common Seal is an excellent example. It has an exceedingly wide range; it is found on both coasts of the North Atlantic, from Spain to Spitzbergen on the east, from Florida to Greenland on the West. The Mediterranean, Black, and Baltic Seas are visited; and it is common on the loneliest shores of Scotland and Ireland. At one time the coast of Cornwall and the Isle of Wight were favourite resorts of this Seal, but the shy creature has almost forsaken these regions for many years. Occasionally small herds enter our river mouths, and not far from the Tay Bridge was once witnessed a terrific encounter between a Seal and a large salmon. For an hour the huge fish made gallant efforts to escape its foe, but eventually the Seal caught and devoured it in triumph. Only a few years ago a Seal was shot in the Thames at Richmond.

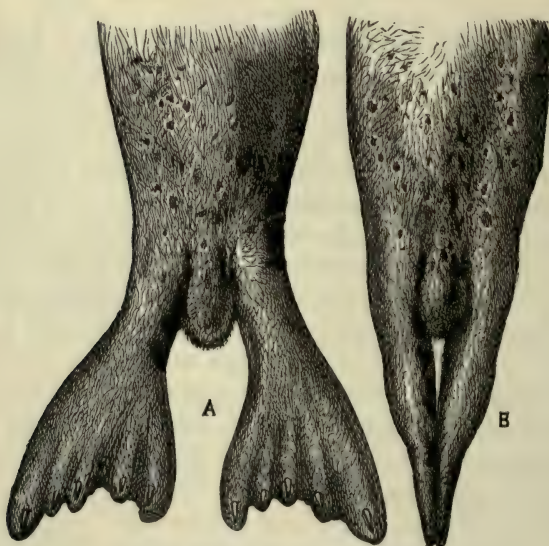
The Common Seal is not a large animal, its length not exceeding five feet. Its rather handsome skin is chiefly yellowish-grey above, with patches and spots of brown or brownish-black; the under surface of the body is much lighter, silvery grey or almost white. There is no under fur, and in consequence the skin, though useful, is of no special value.

Upon the British coasts the Seal is not found in sufficient numbers to make it of commercial importance, chiefly giving rise to the cruel and fruitless sport of Seal-shooting. In other regions, Newfoundland for example, the animal is hunted for the sake of its oil and hide.

It is a most intelligent and affectionate animal, being

easily tamed, and becoming very fond of a kind master. There are several instances known where the Seal became so much attached to the fishermen that it spent the greater part of its time on the shore, and even in the house, only going into the sea for the purpose of obtaining food. It would accompany the boat and return with the fishermen after the voyage.

A Seal that was captured in Clew Bay showed tameness to a remarkable degree for a period of four years. Three



HIND FLIPPERS OF THE SEAL.

A. Open. B. Closed.

times it was taken out to sea and set free, but upon each occasion it returned to its foster home. To test the Seal still further, it was blinded and again set in the ocean many miles from Clew Bay. At the end of eight days it again waddled ashore, as if to prove that the brute beast was in some respects, at least, superior to the inhuman beings, who had so cruelly used it in the satisfaction of a brutal curiosity.

Of other species of the genus *Phoca* may be mentioned

the Grey Seal (*Halichærus grypus*) of the North Atlantic, which is well known on the North British coasts. It is a larger animal than the last named, measuring as much as eight feet in length and attaining a weight of four hundred pounds. It is less gregarious than many of its cousins, usually being met with only in pairs.

The Bladder Nose, or Crested Seal (*Cystophora cristata*), is the largest, fiercest, and most dangerous of the northern Seals. In harpooning it, the Eskimo often finds the animal turn upon him to upset the frail kayak in which he is seated. Probably the hardy Northman considers the capture well worth the risk entailed, for two hundred pounds of flesh and over a hundred pounds of blubber form no mean addition to a scanty larder. The crest of the animal is neither a kind of armour plate to protect it against wounds, nor a bladder to give increased buoyancy, as was once supposed; it is nothing but an enlargement of the nasal passages.

The Greenland Seal (*Phoca grænlandica*) ranges along almost the whole of the Arctic coasts. It is an animal that has given rise to much confusion. Not only do the males and females differ very considerably in size and colouring, but as they grow to maturity they undergo marked changes that have gained for the same species a great variety of names, each really applicable to the Seal only at some particular period in its existence, e.g., Ice Seal, Saddle Back, White Coat, Blue Side, and Harp Seal.

The animal is invaluable to the Eskimos, and at one time in Danish Greenland an annual catch of nearly forty thousand was nothing uncommon. From the crow's-nest of a British sealing vessel could sometimes be seen half a million seals, 'literally covering the frozen waste as far as the eye can reach with the aid of a telescope.' A party from one vessel has caught as many as twelve thousand Seals in a day. Fortunately for the species, however, Hair-sealing for various reasons has ceased to be so profitable as was once the case, and in all probability the Seal is as numerous as ever it was when the annual catch ran into hundreds of thousands.

SEA LEOPARD (*Ogmorhinus leptonyx*).

Coloured Plate XII. Fig. 2.

The Sea Leopard is a Southern Hair-Seal that is found on some of the Australasian coasts; on various islands, such as the Falkland, Auckland, and Lord Howe's; and on the ice pack of the Antarctic Ocean. The Leopard Seal is sometimes erroneously stated to be an entirely different species in the North Pacific.

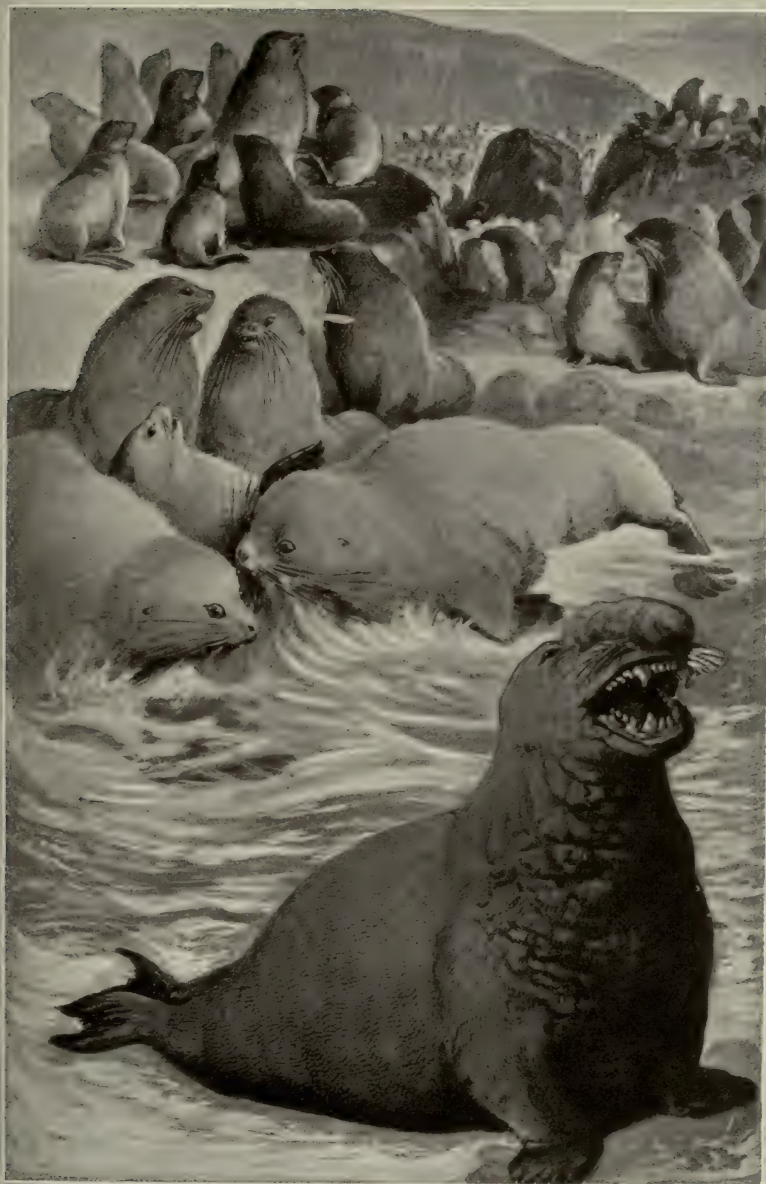
Very little is known of the Sea Leopard, and as sealing in the far South is practically a dead industry, it is difficult to glean accurate facts concerning this cat-like looking marine mammal. In only few museums are male and female stuffed specimens, and occasionally isolated captures have taken place in Australia and New Zealand. The male Sea Leopard attains a length of at least twelve feet. Its skin is a glossy silvery grey, with darker shadings merging into patches of yellowish-white.

SEA ELEPHANT (*Macrorhinus proboscidea*).

Plate XVIII.

The Sea Elephant, or Elephant Seal, is the largest of the marine Mammalia, excepting only the larger whales, for it grows to a length of twenty to thirty feet. Nevertheless, it is just a big black Seal, with the skin of the nose prolonged to hang limply before the mouth for about a foot, which the animal inflates when it is excited or enraged.

This unwieldy creature is common to both hemispheres, but it has been hunted with such ardour that very few exist north of the Equator. In the southern seas it forms practically the only population on many a series of barren rocks, although even there it was at one time hunted by whalers until it was almost a rarity. Once it abounded in immense numbers in the Antarctic Ocean, especially in Kerguelen's Land and neighbouring islands. In the chase of the Sea Elephant sealers ran terrible risks, endured



SEAL ROOKERY AND SEA ELEPHANT.

TO THE
HONORABLE MEMBERS OF THE
LEGISLATIVE ASSEMBLY

incredible hardships, and their reward after a successful voyage worked out at something like ten shillings per week. Only the hide and blubber were sought, the animal having no fur. A bull Sea Elephant will furnish eight to ten barrels of oil; a cow rarely more than six barrels.

'My own recollection of this miserable business is a brief one,' says Frank T. Bullen, 'but quite lengthy enough to make me thankful that I shall never repeat the experience.' He proceeds to relate particulars of a visit to Auckland and Campbell Islands, where, provisions and materials for building huts having been landed, the ship sailed away; it was no place for a vessel to linger at anchor. Better by far face the utmost fury of the open sea.

'We plunged into work of the hardest in order to get things a bit shipshape; but before we had been toiling an hour we were all suddenly startled stiff by a most tremendous roaring, as of a troop of lions newly landed. Coming across a ridge of rock into view of a little exposed bay, we saw at least a hundred of these huge Seals emerging from the broken water and lumbering shorewards.

'We had been told that all we had to do was to smite them fiercely on the nose, and they would fall an inert mass at our feet, when we were to cut their throats immediately. But somehow a sight of them did not seem to inspire us with much confidence in our ability to carry out these simple orders to the letter.'

Presently, when the last of the mighty family had heaved his huge bulk out of the surf and waddled after the rest inland, the sealers, armed only with clubs and knives, got between the animals and the water-line. Their loud yells caused the creatures to come lumbering back to the sea. 'Our chief faced the leader and smote him so felly that the vast mass of the body collapsed like a burst bladder and spread itself upon the ground. Immediately we were all doing likewise, yelling like demons at the same time.'

But the hunters were not to come off scatheless. One man missed his blow and his footing at the same time, and putting his left arm out to save himself from falling, thrust it into the monster's gaping jaws. 'Now the Sea Elephant

can crack pebbles as large as goose eggs like nuts, and does do so, apparently for sport, so that when we drew Sandy from underneath his fallen foe, and prising open the jaw, released his arm, it looked more like some shreds of red rag than anything else.'

'The upshot of the raid was twenty-one elephants killed. We were a study in ruffianism—"gaumed" all over with blood and grease, stumbling over the smallest stone for very weariness, yet compelled to toil on with only a few minutes' rest at long intervals all through the night at the unfamiliar work of skinning those great beasts and securing the masses of fat-laden hide.'

SEA LION (*Otaria stelleri*).

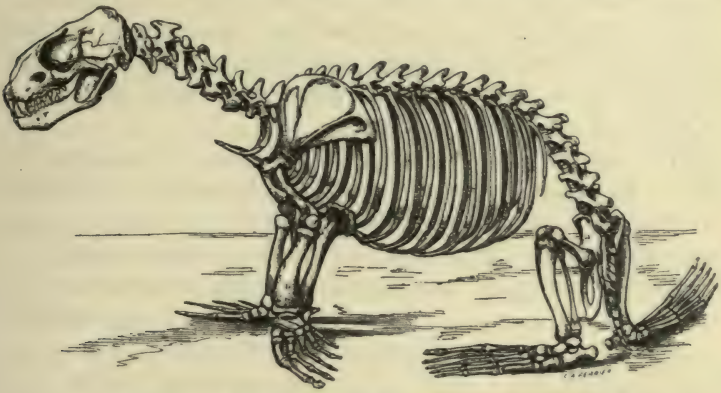
Coloured Plate XII. Fig. 1.

The seals already described either possess no external ears or else they are very small ; in the genus *Otaria*, of which the Sea Lion is the largest, they may be short, but, nevertheless, are very distinct. There are differences in the skull and teeth. All the seal tribe possess strong canine teeth, but the Sea Lion has six molars instead of four, as in the common seal. In addition, the eared seals make progress on land or ice with far more facility than the true seals. The hind flippers are placed at right angles to the body, and these the creature gathers up underneath it, raises itself on the fore limbs, and then gives a push. The movement is extremely cumbersome, but the animal will contrive to mount a slope that a man could not compass without much exertion ; and the Sea Lion is often found quite four miles from the edge of the water.

The home of Steller's Sea Lion is the Bering Sea, and as far South as the Kurile Islands on the one side of the North Pacific and California on the other. In the latter case a rookery of Sea Lions is strictly preserved by the American Government, or probably long ere this the animal would have been exterminated in those waters, as it has been in many other regions after a century and a half of constant persecution.

The male Sea Lion, of eleven or twelve feet in length and

a thousand pounds in weight, is yellowish-brown in colour with shaded darker patches. There is a distinct mane upon the neck, which, with its upright posture, combines to give the creature its supposed leonine appearance. The males are fierce in aspect, and if hard pressed will turn and show fight. Old animals bellow like bulls; the younger ones bleat like sheep. They bolt their fish without mastication. The female is only about half the dimensions of the male, and is considerably lighter in colour. The animal is one of the hair seals, useful only for its hide, flesh, and fat. To the Aleutian islander it is as useful as is the walrus to the Eskimo, and there is scarcely any part of the body that is



SKELETON OF THE SEA LION (WALKING ATTITUDE).

not of service. At one time the catch was forty thousand per annum. The Sea Lion frequents the same breeding-grounds as the fur seals, though the animals keep strictly apart; and an account of a fur seal rookery will, in its main features, apply equally well to the habits of the larger animal.

The Patagonian Sea Lion (*Otaria jubata*) formerly existed in immense numbers. It is chiefly interesting on account of its being one of this species that was first brought to England. Probably this animal is more energetic than its northern cousin, for it often hunts in packs, catching not only fishes and squids, but also preying upon the slow-going penguin.

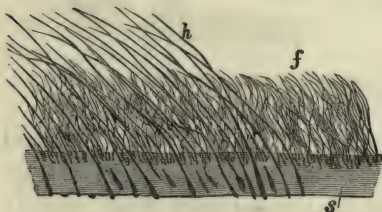
SEA BEAR (*Otaria ursina*).

Coloured Plate XII. Fig. 4.

There are four or five Southern fur seals that have been almost wiped out of existence by continual hunting; but the Sea Bear, or Northern Fur Seal, still resorts in immense herds to the islands in the Bering Sea, though it is by no means so abundant as was once the case.

A full-grown Sea Bear is six or seven feet long, turning the scale at perhaps six hundred pounds; the female is much smaller, seldom reaching five feet in length, and weighing as little as eighty pounds. The male generally is of a greyish tint on the shoulders, the rest of the body varying from reddish-grey to almost pure black; the under parts are of a reddish-brown tint; the female is lighter, a mixture of grey and brown.

The coat of the Sea Bear is the famous 'sealskin' fur. When the skin is first taken from the animal it gives no promise of the soft beauty which makes it so valuable, being apparently coarse and rough. This appearance is caused by



VERTICAL SECTION OF THE SKIN OF
THE FUR SEAL.

The coarser hairs (*h*) penetrate quite through
the skin (*s*).

the thick soft fur which is next the skin. These hairs are removed in a very ingenious manner. Being much longer than the hairs which constitute the fur, their roots penetrate the skin much more deeply. In order to remove them, the dresser lays the skin, with the fur downwards, on a table. With a long-

bladed knife, as sharp as a razor, he shaves off the skin, cutting it just deep enough to sever the roots of the bristles, without touching those of the inner fur. The bristles are then easily removed, leaving the fur untouched.

The gathering together of the seals in the breeding season is one of the most remarkable sights in the world

(Plate XVIII.). At the Pribyloff Islands and other such lonely spots in the North Pacific the male seals begin to arrive early in May. Just as in a gold rush the miner stakes out his location, so the seal allots to himself on the rocky shore a space of about ten feet square as the site for his housekeeping. Normally the seal is a soft-eyed, amiable creature, except in his attitude towards the fish upon which he feeds ; but now he becomes a fierce beast with bristling moustache, glaring eyes, and teeth ever bared towards any of his companions. No sooner has he entered into possession of his freehold site than he becomes engaged in a series of terrible combats with new-comers to retain it.

About the beginning of June the female seals arrive, and then the scene simply defies description. Each bull is bent upon stocking his allotment with partners, and as a female comes swimming in to shore she is pounced upon by a mob of roaring, frenzied males. She is bitten, scratched, banged down upon the rocks, and sometimes literally torn limb from limb ; but usually she escapes so severe a fate and is seized by the neck by a victorious bull, who dumps her down in his reservation. But when he has secured from a dozen to fifteen wives the bull has to battle just as strenuously to keep them. Often a discontented spouse will endeavour to escape to a neighbouring family, and not infrequently, unhappily, a bigger and stronger bull will annex the whole harem, leaving its owner lamenting until he can despoil of his wives another bull weaker than himself.

When the baby seals arrive, about the end of the month, the mothers pay them but scant attention, beyond affording them plentiful supplies of rich milk, upon which the young pups make amazing progress. The bulls appear not to be even faintly interested in nursery matters. Strangely enough the young seal is not a born swimmer ; it is necessary for its mother to give it lessons in the art of natation. The pup proves to be an apt learner, and very shortly thousands of young animals are gambolling in the water of their own accord.

One feature of the seal's life appears to be absolutely inexplicable. For ten months of the year a bull requires a hundredweight of fish a day, and it is no fault of his if the

supply falls short of his necessities. But for two months at the 'rookery' he 'fights, makes love, never sleeps, never drinks, and never eats.' There are many animals that fast for longer periods, but it is always in a season when their natural forces are torpid; but the seals fast 'throughout the most strenuous period each year of their intensely strenuous life.' In any case food is scarce in the neighbourhood of a rookery, for the appearance of the seals is the signal for the fish to remove themselves elsewhere.

What the pups live upon after the time they are weaned until the whole colony goes to sea again is equally mysterious; for if one is killed its stomach will be found to contain only stones.

By the end of October the breeding location is deserted; the thousands of its late tenants are scattering themselves over the free ocean. No one can accurately gauge the extent of their wanderings during the eight months which elapse before they return to the earnest life of the rookery. The killer whale probably knows something about it, for one of these ocean wolves, when captured off the coast of California, had no less than fourteen fairly large seals in its capacious maw. Sharks take a bite out of the sleeping seal as it lies afloat upon the curling waves, and the Polar bear on the icefloes stealthily cuts off its retreat to the water.

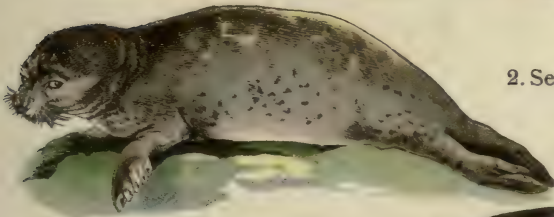
But these inroads upon the numbers of the seal family count as nothing compared to the fierce toll which man takes. Even within recent years a hundred thousand Fur Seals have been taken in one season in the Pribyloff Islands alone. 'It is a sordid, horrible business, which cannot be written about nicely.' In their greed for gain the sealers are charged with skinning their victims while they are but stunned, and one writer (Burn-Murdoch) tells of the newly flayed seal lifting itself redly towards heaven, in the glowing sunshine, as if asking its Maker why this thing should be.

The Northern Fur Seal was likely to be exterminated until Government intervention insisted upon giving the seal a close time, protecting the immature animal, and especially preventing the capture of the creatures when on their way to the breeding grounds. Even though the

1. Sea Lion



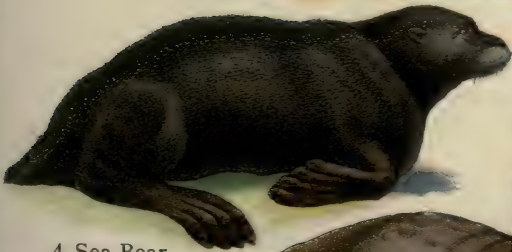
2. Sea Leopard



3. Common Seal



4. Sea Bear



5. Walrus





regulations be constantly broken by lawless men who risk the remote chances of detection, the seal harvest in any year is not equal to what it was when indiscriminate slaughter was general; but moderate seasons in perpetuity will stand for wealth incalculable, instead of a few flush seasons that would have spelt extinction for one of the most wonderful, amiable, and intelligent of God's creatures, whether on land or in the sea.

WALRUS (*Trichechus rosmarus*).

Coloured Plate XII. Fig. 5.

Standing alone, a real monster of the deep, the Walrus, Morse, or Sea Horse is the most extraordinary member of a remarkable family. The word 'Walrus' is of Scandinavian origin, and literally signifies 'Whale Horse'; though why, in naming one of the most ungainly of the brute creation, it was thought necessary to libel one of the most beautiful of our animals, the horse, is difficult to comprehend.

'None can compete with the Walrus for clumsiness. He has a gigantic body—in the fullest grown adult about a ton in weight—and about as unsymmetrical as a leathern bag of oil. It is covered with a tough, gnarled hide, scantily clothed with coarse brown hair, very patchy—in fact, not at all unlike one of those old hair-trunks we used to see occasionally. The fore flippers are very short, and the hand-like members are planted flat at almost right angles to the body, while the hind flippers have no legs to them, being apparently just an ornamental appendage to the body in lieu of a tail. Consequently, he who can watch the progress of a Walrus over land or ice and not laugh must be quite devoid of humour, for it is certainly one of the most droll-looking methods of progression conceivable.'

The Walrus is practically restricted to the Arctic Circle, though two or three centuries ago it abounded off Norway, and one was seen as far South as the Orkney Islands in 1857.

The outstanding singularity of the immense animal, which often measures eighteen or twenty feet in length and ten or twelve in circumference round the chest, consists in the con-

struction of the skull. The lower jaw lacks both incisor and canine teeth, and is compressed laterally to fit in between two enormous canine teeth, or tusks, which are set in the upper jaw, and are inclined downwards with a gentle curve. The length of these tusks is sometimes a couple of feet, with a girth of seven inches at the base, and each weighing upwards of ten pounds. The primary object of the ivory tusks is to act as ice-hooks, enabling the animal to haul itself out of the water on to the ice. They are also used in raking out of the sand and mud the cockles, mussels, worms, and other shore-frequenting creatures on which the animal feeds. It does not disdain the offal of a

dead whale, or indeed any animal food that calls for no chase in getting it.



SKULL AND DENTITION OF WALRUS.

A. Skull of adult animal.

B. Palate and dentition of young.

C. Lower jaw and dentition of young.

The nostrils of the Walrus, instead of terminating in a snout, are situated far above the mouth, on what appears to be the middle of the face. The ears are merely two small orifices; the neck is short; the lips are thick. Almost all the hair-producing power of the animal seems to be concentrated in the upper lips, which are thickly covered with enormously developed bristles,

sharply pointed, and so large as to remind the spectator of the quills of the porcupine. The generic name, *Trichechus*, is formed from a Greek word signifying a hair or bristle.

Notwithstanding its intensely ferocious appearance, the Walrus is a markedly inoffensive creature, except during the breeding season, when the males will fight desperately with each other for the locality which they select for their nurseries, and the result is that there is not an old male to be found that is not covered with scars from the tusks of his rivals.

The Walrus is a very sociable creature, loving to herd in hundreds. Captain Cook thus describes his meeting with

the animal off the northern coast of America: 'They lie in herds of many hundreds upon the ice, huddling over one another like swine, and roar and bray so very loud that in the night or foggy weather they gave us notice of the vicinity of the ice before we could see it. We never found the whole herd asleep, some being always on the watch. They were seldom in a hurry to get away till after they had been fired at; they would then tumble over one another into the sea in the utmost confusion. . . . The dam, when in the water, holds the young one between her fore arms.'

No animal, perhaps, takes its parental responsibilities more seriously than the Walrus, which will undergo much privation for the sake of its young. The great tusks which are so vitally necessary to the existence of the animal, only attain a length of one or two inches by the time the young one is two years old. When a young male, in particular, is nearly as big as his mother, he will still take milk from the patient dam, who will also grub up succulent morsels to satisfy the appetite of her ponderous offspring.

In one respect at least the Walrus is fortunate—it may be considered to have no serious enemy among the animal inhabitants of the chilly regions where it dwells. The Polar Bear, gaunt and ravenous, will not enter joyfully into a conflict with a Walrus, for it knows that the ivory tusks are capable of being put to sterner use than digging in the mud for shellfish, &c. It is difficult, too, for even the bear's terrible claws to make much impression on the thick and leathery hide.

The Walrus, however, is no match for the Polar Bear in cunning, and often it is roused out of its sun-bath on the edge of the ice by the onslaught of the foe, which has stealthily crept up to take the huge creature by surprise. If the bear can leap on to the shoulders of the Walrus, while it is yet some distance from the water, the result is, more or less, a foregone conclusion—no skull could withstand the terrible blows which the bear deals it. But if the Walrus can slip into the water before it is incapacitated, it has more than a sporting chance of effecting its escape. There are limits to the diving powers of the bear, who speedily comes to the surface, sadly disappointed, and in a

temper that bodes ill for the next prospective prey that is encountered.

To the Eskimo tribes, the Walrus is the first necessity of life. From the skin are made the coverings of the kayaks, or canoes, in which the Eskimo hunts the seal and the Walrus. The bones furnish him with the runners for his sledges and the heads of his weapons, while the tusks form the points of his spears and harpoons, and are also cut into fish-hooks, the weights of bird-slings, and similar objects. The intestines are split, and twisted into twine of great strength, from which are made the nets and fishing-lines on which the livelihood of the native largely depends. The flesh supplies him with ample stores of food, while the abundant fat is used as fuel in the stone lamp, without which the Eskimo could not possibly live.

It need scarcely be said that man has wrought terrible havoc among the Walrus tribe. King Alfred records how Othere and his men made a fine battue of these marine mammals on the coast of the Arctic Ocean, and it is a well-known fact that the Greenlanders paid their contribution to the cost of the Crusades in Walrus tusks. In later times one hears of the voyagers to Spitzbergen slaying nine hundred Walruses in a few hours. Mr. Lydeker says that in the ten years 1870-80, Russian whalers alone obtained 400,000 pounds of ivory and 2,000,000 gallons of Walrus oil. These figures point to the capture of at least a hundred thousand Walruses. The diminution in their numbers has reduced Walrus-hunting to rather a low ebb, but so long as there are sufficient to meet the needs of the Eskimo all may be accounted well.

Chapter VIII

ORDER V.—RODENTIA (GNAWING ANIMALS)

SUB-ORDER 1.—SIMPLE-TOOTHED RODENTS

SUB-ORDER 2.—DOUBLE-TOOTHED RODENTS

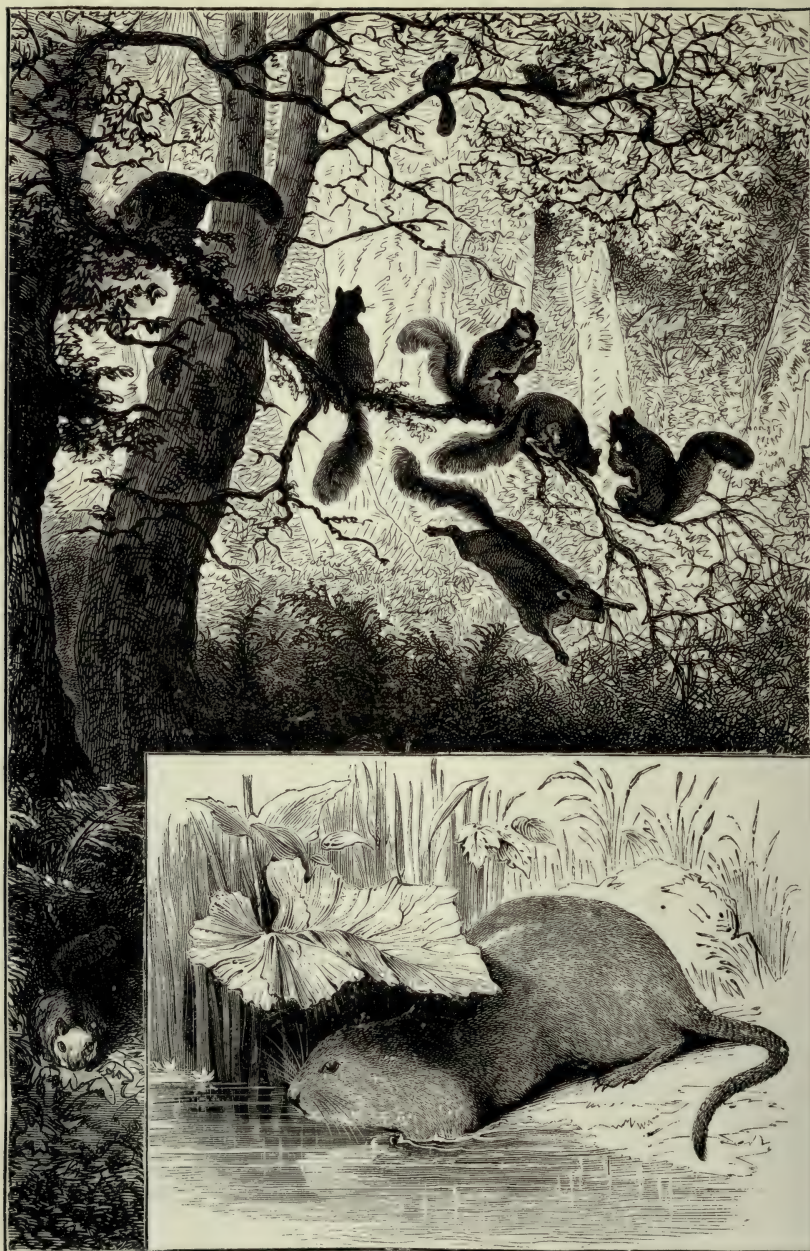
General description of the Rodentia—Table of Sub-orders—Common Squirrel—Grey Squirrel—Taguan Flying Squirrel—Polatouche—Assapan—Anomalure—Chipmunk—Marmot—Wood-chuck—Prairie Dog—Beaver—Mouse-like Rodents—House Mouse—Field Mouse—Harvest Mouse—Dormouse—Black Rat—Brown Rat—Field Vole—Water Vole—Musquash—Hamster—Lemming—Jerboa—Cape Jumping Hare—Porcupine—Chinchilla—Viscacha—Agouti—Guinea Pig—Capybara—Hare—Rabbit—Pika.



AMERICAN GREY SQUIRRELS.

(See page 213)

(Photo W. S. Berridge, F.Z.S.)



1. FLYING SQUIRRELS.

(See page 214)

2. WATER VOLE.

(See page 232)

CHAPTER VIII

Order V.—Rodentia (Gnawing Animals)

THE Rodents are small or moderately sized animals, many of which in their external appearance strongly resemble some of the Insectivora. They are more widely distributed than any other order of the Mammalia; except in the extreme Polar regions they are found everywhere, although Australia, especially considering its size, is poorly represented. There are quite a thousand species, some of which are marked by their countless myriads of individuals; and in this respect it is fortunate for mankind that most of them are 'Wee, sleekit, cowerin', tim'rous beasties.' Nevertheless they have very diverse habits. They are among the swiftest of the Mammalia, they are diggers and delvers in the earth, they are flying gymnasts, they are expert divers, or they are agile leapers whose movements the eye can scarcely follow.

The word 'Rodent' literally means a gnawer, and is given to the animals on account of the structure of their teeth. Of grinders they are usually furnished with at least three above and below on each side. Canine teeth are altogether absent. They all possess two incisors in each jaw, which occupy more than half the space; in a very few species there is a pair of small or rudimentary incisors in the upper jaw. The number of grinders may differ, but the incisors are always widely separated from them. Their outer surface is faced with enamel, which wears more slowly than the softer inner side of the tooth, so as always to present a

sharp edge like that of a chisel, whose cutting edge consists of a plate of hard steel backed by softer iron.

The incisors, set exactly opposite each other, need continual use to preserve their cutting edge. As fast as the teeth are worn down fresh material is supplied from the hollowed base. The growth of the incisors in the Rodents is so rapid that the animals must continually gnaw if they are to exist in comfort, or in fact to exist at all, for they would grow to such a size that it would be impossible to open and close the mouth. Hence, when a Rodent is not employing its teeth on food, it apparently engages them in the wanton destruction of some hard substance altogether

useless for food; or failing that, it works its jaws incessantly from side to side, grinding the teeth against each other, ever seeking to prevent the possibility of overgrowth.



HEAD OF A RABBIT.

Showing abnormal growth of incisor teeth.

The illustration of the rabbit's head shows what happens when the animal breaks an upper incisor of the right side and a lower incisor of the left side. The unbroken teeth grow unchecked, following the curve

of their sockets, and assuming the remarkable forms which are there figured.

The Rodentia are for the most part vegetable feeders; some are really omnivorous; and the majority of them are particularly destructive to grain, whether in the crop or garner. The fur of some of the species is of considerable commercial importance; and there are few of them whose flesh is not fit for food, though in several cases its odour leaves something to be desired. In England hares and rabbits are the only Rodents which are usually eaten, but mankind is as omnivorous as any of the beasts of the field, and in one region certain animal food is accounted a delicacy, which in another is viewed with loathing.

THE
CITY OF
NEW YORK



1. Guinea Pig



2. Chinchilla



3. Porcupine



4. Rabbit



5. Capybara



6. Hare



7. Golden Agouti



8. Syrian Hyrax

Owing to the number of species of marked similarity in structure, zoologists have not always agreed concerning the classification of the Rodents, but it is generally acceptable to divide them into two Sub-orders :—

I. Simple-toothed Rodents (*Simplicidentata*), or those species which never possess more than two incisors in the upper jaw.

This Sub-order is again divided into three sections :—

1. Squirrel-like Rodents (*Sciuromorpha*).
2. Mouse-like Rodents (*Myomorpha*).
3. Porcupine-like Rodents (*Hystricomorpha*).

II. Double-toothed Rodents (*Duplicidentata*). This Sub-order contains only two families, of which that of the Hares and Rabbits contains four times as many species as the family of the Pikas.

Sub-Order I.—SIMPLE-TOOTHED RODENTS

SQUIRREL-LIKE RODENTS.

FAMILY SCIURIDÆ (SQUIRRELS).

RED SQUIRREL (*Sciurus vulgaris*).

Coloured Plate XIV. Fig. 4.

The Squirrel, light, nimble, and graceful, is practically distributed throughout all the world except Australia, and is particularly abundant in North America. With comparatively few exceptions the animal is a tree-dweller, for which its fore feet, with finger-like toes and sharp nails, specially fit it.

The Common or Red Squirrel of the British Isles is a pretty little animal of about fifteen inches in length from the tip of its nose to the end of its tail. It is clad in a coat of



CLAWS OF THE SQUIRREL.

short, silky, russet-brown fur above ; below it is principally white. The species extends from Norway to Japan and from Lapland to Italy. On the Continent and in Northern Asia the animal is a little larger in size, and in the colder regions the fur changes to grey or nearly white. On the whole russet brown or red is the prevailing colour of the Squirrels ; a Chinese variety has a red and black coat and, strangely enough, red teeth.

The ears of the English Squirrel are erect and usually tufted ; its eyes are large and black and sparkling. Its long, spreading, bushy tail is carried erect when the animal is running on the ground or along a branch ; but in the course of its leaps it is extended behind, and serves at once as a rudder and a parachute. It can run up or down a tree trunk with astounding facility ; and it can leap from a great height without fear of injury. It is extremely vigilant, and the merest tap upon a tree trunk will cause the Squirrel to take instant flight out of its branches.

During the heat of the day the animal generally sleeps. Its almost spherical nest of interlaced twigs, grasses, leaves, and moss is an artistic and perfect specimen of animal architecture that perhaps no other mammal, unless it be the harvest mouse, can equal ; it is rain-proof, and, secure in the fork of a lofty branch, will defy a gale.

A single pair of Squirrels often mate for life, and occupy the same nest year after year. The family of three or four is born in the middle of summer, and the young ones remain with the parents until the following spring, when they take on the cares of housekeeping for themselves.

In addition to its ordinary food, nuts, acorns, fruit, seed, and beech-mast in particular, the Squirrel will eat insects, and plunder nests of their eggs and young. In Canada the little animal, when driven by hunger, will attack the meat with which traps are baited to catch some of the fur-bearing carnivores. In feeding, all Squirrels sit up on their haunches and hold their food in the forepaws.

The Squirrel does not hibernate in the true sense of the word. In autumn it commences to lay up stores of provisions on which to subsist when the country is in the icy clutch of winter. It forms little magazines of food

in various selected spots, where it almost invariably finds them when an occasional fine winter's day wakes the animal up from its long sleep. When it has dined it again retires to resume its slumbers. In the warmer regions the Squirrels do not sink into a state of torpidity at any time of the year.

The Squirrel makes a charming, frolicsome pet, and there are few persons who cannot take pleasure in its antics. In some American public parks the animals are given their freedom, and their merry life in the trees is an additional charm to the public pleasure resorts. It has been proposed to adopt the same plan in London. There is no doubt that the Squirrels would permanently make their homes within the confines of the parks, and it is equally certain that the London cat would assume it was its special prerogative to add squirrel-hunting to its many misdoings. The hordes of town-bred cats have developed quite wonderful arboreal powers, which have already resulted in the disappearance from the parks and gardens of many charming little songsters, who can no longer nest there in safety. The mother Squirrel would be faced with the same difficulty, for if the old ones escaped the feline prowler, the young Rodents would fall victims whenever they descended to the ground.

The best-known Squirrels of the United States and Canada are the Black or Fox Squirrel (*Sciurus niger*), nearly three feet in length, and the smaller Grey Squirrel (*Sciurus carolinensis*). Some of these animals have been set free in the Zoological Gardens, where they are great favourites with visitors (Plate XIX.). The Grey Squirrel was at one time a pest in the New England States, vast numbers of the animals migrating from one region to another, devastating large tracts of cultivated land in the process. Under an old Pennsylvanian law threepence was paid by the State for each head of this animal ; and in a single year in the middle of the eighteenth century the Government paid no less than £8,000 on this account. This meant the death of nearly two millions of the little animal, whose ornamental fur, which is quite different from the grey coat of the Siberian variety of the Common

Squirrel, goes to make the 'squirrel cloaks' that are such coveted wear.

The tropical species of Squirrel are often more beautifully furred than their Northern brethren. One of the best examples is the Jelerang (*Muscardinus avellanarius*), or Javan Squirrel, whose brownish-black coat merges into yellow on the sides and abdomen, the same tint adorning the head of the animal.

TAGUAN FLYING SQUIRREL (*Pteromys petaurista*).

Plate XX. Fig. 1.

The Taguan is one of the best examples of the Flying Squirrels. It is a native of India and the further south-east. It is rather a large species of the family with a body from two to three feet in length and a tail of twenty inches. Its colour is chiefly clear chestnut, deepening into brown on the back. The skin of the flanks is modified in something like similar fashion, but to a much less extent than in the Colugo or Flying Lemur. In this present case the flying membrane extends to and includes the limbs only as far as the wrists and ankles, and particularly it does not include the tail. The skin is developed to such a degree that when the animal is sitting, the paws only just appear from under the soft folds of the delicately thin membrane.

When making one of its marvellous leaps, the Taguan first stretches out its four limbs to their fullest extent; and then, taking off at a greater height than where it will alight, it is upborne through the air on the furry parachute. Strictly speaking the action thus described is not that of flying; it more resembles the daring dive of the gymnast from the flying trapeze; but nevertheless the mode of progression well serves the Taguan in moving with the utmost rapidity from tree to tree.

Various species of Flying Squirrels are found from Lapland and Finland, through Siberia, to China and Japan; and in North America as far south as Guatemala. The



1. POLATOUCHE.

2. ANOMALURE.

Polatouche (*Sciuropterus volans*), Plate XXI. Fig. 1, is an elegant little creature, whose tawny brown body is only six inches long; on the outside of the limbs and the flying membrane it is darker. In winter the silky fur not only becomes longer, but the main portions of it change into silver grey. Like its bigger relative, the Taguan, this little flier is nocturnal, only leaving its soft-lined nest in a hole in a tree when dusk arrives. Though it is really a diminutive creature even when stretched out in flying attitude, it can take flights of thirty yards with ease. The Assapan (*Sciuropterus volucella*) is the North American Flying Squirrel. It is even smaller than the preceding, but often attracts more attention, if only because a number of sociable Assapans engage in their evening evolutions, whereas the Polatouche usually moves about alone or only in pairs.

ANOMALURE (*Anomalurus fulgens*).

Plate XXI. Fig. 2.

Though it is a Flying Squirrel, the Fulgent Anomalure presents marked differences in construction sufficient to raise it to the dignity of a separate family. It is a West African animal, found chiefly in the Gaboon region.

One special point of difference rests in the fact that in front the flying membrane extends, not from the wrists, but from elbow to elbow, being additionally braced by a rod of bony cartilage, almost as though the animal possessed four front limbs. The flying membranes of the Colugo, the Taguan and its allies, and the Anomalure, really differ only in the points of attachment to the limbs, but the last-named animal exhibits a feature that is entirely absent in the others. On the under side of the root of the long, thickly-haired tail is a row of horny scales, which are useful as an additional aid in holding securely to the bark of a branch while preparing to take a flying leap.

CHIPMUNK (*Tamias striatus*).

Plate XXIV. Fig. 3.

The true Ground Squirrels, of which the North American Chipmunk is the best known, are, first and foremost, burrowers ; but they are equally at home in whisking about brushwood and small timber. The animal is also known as the Hackee, or Chipping Squirrel. This last name is gained from the animal's little cry, like the chip-chipping of a newly hatched chicken. It is a beautiful creature in form and colour, and, including its tail, is just under a foot in length. On the back the fur is brownish-grey, warming into orange-brown on the forehead and hindquarters ; upon the sides are stripes of black and yellowish-white ; but the colours vary considerably, being generally lighter in the north. If only the fur were less common and more difficult to obtain, it might easily take as high a rank as sable or ermine.

The American Ground Squirrel extends roughly from the St. Lawrence and Manitoba as far south as Missouri and Georgia ; and what is practically the same animal is found in the north-east of Europe and across Northern Asia. They live in burrows deep enough to afford protection from the severe cold in winter. Most of these burrowing squirrels have cheek pouches, which are specially useful when the animals are storing up food for winter use. They have very liberal ideas of what their needs will be during their retirement, and though it is hard work to dig the animals out of the frozen ground—in Siberia, for example—the poor natives are satisfied with the hoard of nuts and roots which usually rewards them for their trouble.

Being ground-dwellers, the Chipmunk and its various relations are always liable to be raided by birds of prey and various of the carnivores ; but the female breeds twice a year, and thus the animals abound sufficiently to migrate in quite large bodies when the food supply of any region makes it advisable for them to change their quarters.

MARMOT (*Arctomys marmotta*).

Coloured Plate XIV. Fig. 7.

The Marmot in appearance differs from the chipmunk only in its heavier build, its shorter tail, and its stronger claws for more extensive burrowing. In disposition and ordinary movement it is sluggish, and under no circumstances is it a tree-climber in the Old World. The various species are restricted to the Northern Hemisphere. The best known is the Alpine Marmot, which is about the size of a rabbit. It inhabits the higher regions of the Alps, Pyrenees, and Carpathians, at elevations of seven or eight thousand feet, and is the only European warm-blooded quadruped found permanently at so great a height.

The burrows of a Marmot colony, which in Europe are found in open spaces very near the line of perpetual snow, are rather complicated. They consist of a number of chambers approached by narrow tunnels six or more feet in length, from which the animals issue to feed on the mountain herbage, roots, leaves, and seeds of various plants. While they are feeding, one or more of the number keep watch to prevent surprise by enemies. The slightest unusual circumstance will cause the sentinels to give the alarm, and the animals at once dart for the entrances to the burrows, where they sit up to look back and ascertain the nature of the threatened danger. If it is not a false alarm they dive headlong into their retreats. Very often they quickly reappear, but two alarms, even though they are in quick succession, will cause them to remain underground for the rest of the day.

The squirrel wakes up from its winter sleep at intervals to pay visits to its various storehouses ; but the Marmots, in their grass-lined burrows, stop up the outlets. The earlier portion of their retirement is spent in eating their stores, and then, huddled up in parties of a dozen or fifteen, they sleep for as long as six or seven months. Just before the retiring season the Marmot is very fat and its fur is in excellent condition ; and this is the time which is chosen for Marmot-hunting.

At one time it was no uncommon event in England to see an Alpine Marmot carried by a Savoyard beggar ; but nowadays a monkey is the usual aid to extract coppers from the charitable, probably because its antics are more pleasing to children. There are other Marmots very similar in appearance and habit. The Bobac (*Arctomys bobac*) is found in Eastern Russia and throughout Siberia to the shores of the Pacific ; the Hoary Marmot (*Arctomys pruinosus*), one of the largest species, lives in the north-west of British North America, certainly as far North as the Arctic Circle.

WOODCHUCK (*Arctomys monax*).

The Woodchuck, the smallest of the American species, only measures twenty inches, including the tail. Preferring to live in hillsides or open grass land near to cultivated districts, the Woodchuck is often responsible for much damage to agriculture. In the New England States it has sometimes been found necessary to offer rewards to keep down the number of the animals. The Woodchuck, unlike its relatives, will sometimes ascend trees, especially when it is pressed by an enemy. It appears to fix the time of its retirement to its winter quarters altogether regardless of climatic conditions. At the end of September it vanishes for months. Thus it comes about that it is often underground during weeks of genial weather and while there is abundance of food ; and in the succeeding spring it reappears when, owing to the belated season, winter has not really taken its departure. Its retirement and its reappearance a month later in each case would appear to make for comfort, and why the animal's instinct does not suggest such a course cannot be explained.

PRAIRIE DOG (*Cynomys ludovicianus*).

Plate XXII. Fig. 2.

The Prairie Dog is not a member of the canine family, and in form and habits it bears not the least resemblance to a dog. The animal probably gains its name on account of

its bark-like cry when alarmed. It is also called the Barking Squirrel, which is strictly appropriate, as it is simply a Marmot inhabiting the prairies to the east of the Rocky Mountains. In its general size and coat the animal is undoubtedly of the ground squirrel type, though its head is rounder and it possesses a tail only three inches in length.

The Prairie Dog is gregarious, often living together in huge numbers in a labyrinth of burrows and tunnels, which is usually called a 'dog town.' The warren does not appear to be of haphazard construction, for there is always a number of tunnels, unbroken by burrows, which serve as the main thoroughfares. A 'dog town,' under usual circumstances, is a scene of peaceful animation. In front of every hole is a little hillock of earth, which the Prairie Marmots use as seats and watch-towers. If danger threaten, the very first yelp of alarm is sufficient to cause the whole populace to disappear in a cloud of dust, thrown up by countless legs and tails. The animal is in no sense a hibernator, only retiring during the most severe period of the winter.

Alien inhabitants are viewed with dislike in the cities of men, and measures are taken to restrict their entrance, or at least to enforce obedience to the laws of the community. The inhabitants of a 'dog town' are helpless against two intruders who often take up their residence with them. The rattlesnake and the burrowing owl not only seize upon ready-made quarters, but mainly subsist upon the young of their unwilling hosts.

FAMILY CASTORIDÆ.

BEAVER (*Castor fiber*).

Coloured Plate XIV. Fig. 9.

The Beaver, the sole representative of the family, is an aquatic animal, one of the largest of the Rodents, attaining a length of three feet. It is stoutly and heavily built, especially in the hind-quarters. The legs are short and strong, and the five toes on each foot are sharply clawed ;

on the second toe of the hind foot is an additional claw, assisting to make the foot a better comb for the animal to dress its fur. The hind feet only are webbed to the nails. The head is large and round and the ears are short; the tail, broad and flat, is scaly and furrowed. The coat of the Beaver is very thick and peculiarly soft and silky; it is chestnut-brown above and greyer below. The fur is generally darker towards the northern limits of the animal's habitat.

A few centuries ago the Beaver was common to almost the whole of Europe, from Wales to the Urals, and it extended across all Northern Asia. It has disappeared entirely from Britain, and the few that still exist in Europe are to be found only in Scandinavia and Poland, and only there because they are strictly preserved. There used to be Beavers in the Thames, and they existed in Wales as late as 1188.

The American Beaver was extremely common when the continent was first discovered, but comparatively very few now remain in the United States, chiefly in the West; and in Canada their numbers are being steadily thinned towards vanishing-point. In 1743, from Quebec alone, 127,000 skins were exported to England, and the depletion has proceeded apace since that time, until now in the course of a whole year perhaps not more than a few thousand Beavers fall to the trapper.

The Beaver figures in the Canadian national shield as an emblem of industry and sagacity; and, indeed, if only half of humanity was as intelligent, as provident, and as laborious, ours would be a very different world. It is chiefly its constructive capacity that attracts popular interest, and of all animals it is the most methodical engineer and builder.

Living in smaller or larger societies, the animals select a site in a stream upon which to rear an elaborate habitation. They require still water of sufficient depth to leave at least the bottom of it free of ice even in the most severe frost; and as timber is an absolute necessity, the animals only frequent streams with wooded banks. The incisor teeth of the Beaver are large, and so hard that the Indians use them for cutting bone; and the animals find little difficulty

in gnawing through the trunks of trees six or seven or as many as eighteen inches in diameter. Trees on river-banks usually lean towards the water, and consequently they fall in the right direction.

A tree is stripped of its branches and is then cut into logs from three to six feet in length, which are conveyed to the bed of the stream, and with the branches, stones, and mud are built up into a dam. Sometimes a dam is two hundred yards long, from ten to twelve feet in thick-

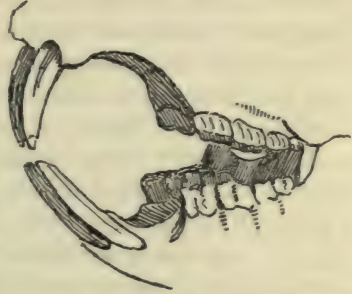
ness at the bottom, narrowing to about two feet at the top. The dam is either straight or curved, as called for by peculiarities in the bed of the stream.

Within the pool thus formed the Beavers build 'lodges,' somewhat dome-shaped houses, of branches, moss, and mud, each large enough to afford accommodation for five or six animals. The lodges, of which there are sometimes as many as thirty in a 'village,' are connected with the bank by burrows, the entrances to which are always under water. There are two reasons for this precaution—it is a protection from the wolverene, which dislikes water as much as a cat; and it enables the Beaver to reach or

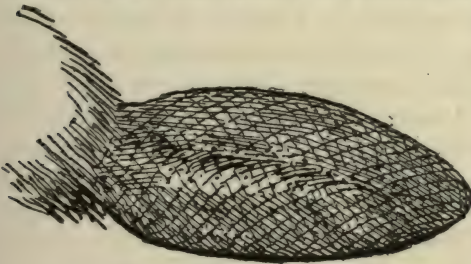
leave its retreat, to gain access to food, when the river is frozen over to a depth of three feet or more.

The mud roof of a lodge is repaired or renewed every year. The plaster-

ing is done with the fore feet, and not with the tail as is so often stated. The Beaver only uses its hind legs in swimming, and the tail is simply a rudder, particularly



JAWS OF THE BEAVER.



TAIL OF THE BEAVER.

serviceable when the animal is propelling a log to a desired spot.

In winter, the wolverene, the inveterate foe of the Beaver family, comes across the ice to a lodge. But the compost of mud and moss is frozen into almost the solidity of concrete, that would offer good resistance to iron tools, and the carnivore's claws make little impression upon it.

Though the Beaver does not hibernate, it is far less active in winter, only leaving the lodge to pay a visit to the heap of logs fastened down in the mud. Having dragged a log out of the store, the Beaver eats the bark and then usually applies the timber to strengthen the dam. In summer the animal eats the roots and stems of various aquatic plants, but bark is its staple diet.

The Beaver is hunted for its fur, which is employed for expensive articles of apparel. It also yields castoreum, which is obtained from two glands near the end of the body. At one time used in medicine, the odoriferous substance is now chiefly employed in perfumery. Beavers can scent castoreum at a considerable distance, and are irresistibly attracted by it. When a hunter sets a trap he fixes it about six inches below the surface of the water, and from it projects a twig that has been dipped in castoreum, or 'barkstone,' as the trappers call it. The Beaver, drawn to the spot by the powerful odour, often falls a victim to the hidden snare.

It is asserted that sometimes are found lazy Beavers who will not assist in building dams or lodges. As these drones are usually males, it is most probable that they have been conquered by their stronger brethren in fights for partners, and then driven out of the community, to become idlers from necessity rather than from choice.

MOUSE-LIKE RODENTS.

FAMILY MURIDÆ.

The Muridæ is the largest and most typical family of the Rodents. They are mainly small animals, and include some of the tiniest of the mammals. Mice and Rats are almost

too familiar to require description, but there are a number of other animals whose relationship to them might not at first glance be suspected.

Most of the Mouse-like Rodents are terrestrial, but among them we find climbers, jumpers, and swimmers, many of which, to accord with their particular habit, have some modification of structure. Some or other of the three hundred and thirty species are found throughout the world. The Common Mouse and the Common Rat in particular are cosmopolitan, having accompanied the white man in his restless wanderings into the uttermost corners of the earth. Individually, any one of the Muridæ family is practically insignificant in size, and in natural disposition is one of the most timid of living creatures. But many of the smaller omnivorous species are so prolific, and multiply to such an amazing extent, as to demand far more attention than very many larger animals.

It is manifestly impossible to describe a tithe of the various species, but it will not be difficult to give a selection of typical representatives that will well serve for the whole.

HOUSE MOUSE (*Mus musculus*).

Plate XXIII. Fig. 2.

This small creature possesses the characteristics of the true Rodent, and a brief description of its structure will in the main apply equally to the larger members of the family. The fur is usually of a brownish ash colour above and light beneath—just the colour that renders the animal difficult to detect at night-time. Its legs, with squirrel-like paws, are short and noiseless for creeping. The ears and eyes are large, in agreement with the watchful creature's necessities. The forepaws are used as hands, during which time the tail assists to steady the body in sitting up. The long, flexible, scaly tail is very sensitive to touch. Though so small, the incisor teeth of the Mouse, with their rasp-like edges of enamel, can



SKULL OF THE
MOUSE.

easily gnaw through boards, and even through leaden pipes.

The Mouse makes a ball-like nest of rags, paper, wool, straw, and all kinds of nibbled litter, in which it brings forth a family several times a year ; and in fifteen days the young ones are able to foray for themselves. When only a few months old they commence to bring litters into the world ; which accounts for the fact that the natural enemies of Mice make so little impression upon their numbers.

In ordinary dwelling-houses Mice cause considerable annoyance ; but in stores, warehouses and barns their opportunities for mischief are increased a hundredfold. Rickyards are the happiest abodes of the little Rodents, which can make their runs in and under a cornstack secure from disturbance until the corn is threshed. At the threshing of one rick it is nothing unusual to capture Mice by the bushel, and the quantity of grain they consume may easily make inroads upon the farmer's profits.

FIELD MOUSE (*Mus sylvaticus*).

The Field Mouse, often called the Wood Mouse, frequents gardens, hedgerows, and cornfields, although in winter it does not hesitate to seek shelter in barns and outhouses. In rickyards it is common, but in far less numbers than the foregoing. It makes its home in any small crevice, under the roots of trees, and often in the deserted runs of the mole. It is distributed over all the temperate regions of Europe.

It is slightly larger than the common mouse, and its tail is nearly the length of its head and body ; the legs, too, are rather longer. The fur is reddish grey, with a spot of light brown on the chest.

The food of the Field Mouse consists chiefly of grain and seeds, acorns and nuts, of which it stores up a considerable quantity for use during the winter. Though the creature works no little injury to crops, the greatest damage arises from hogs rooting up the ground in search of the winter hoards of the thrifty little Rodents.

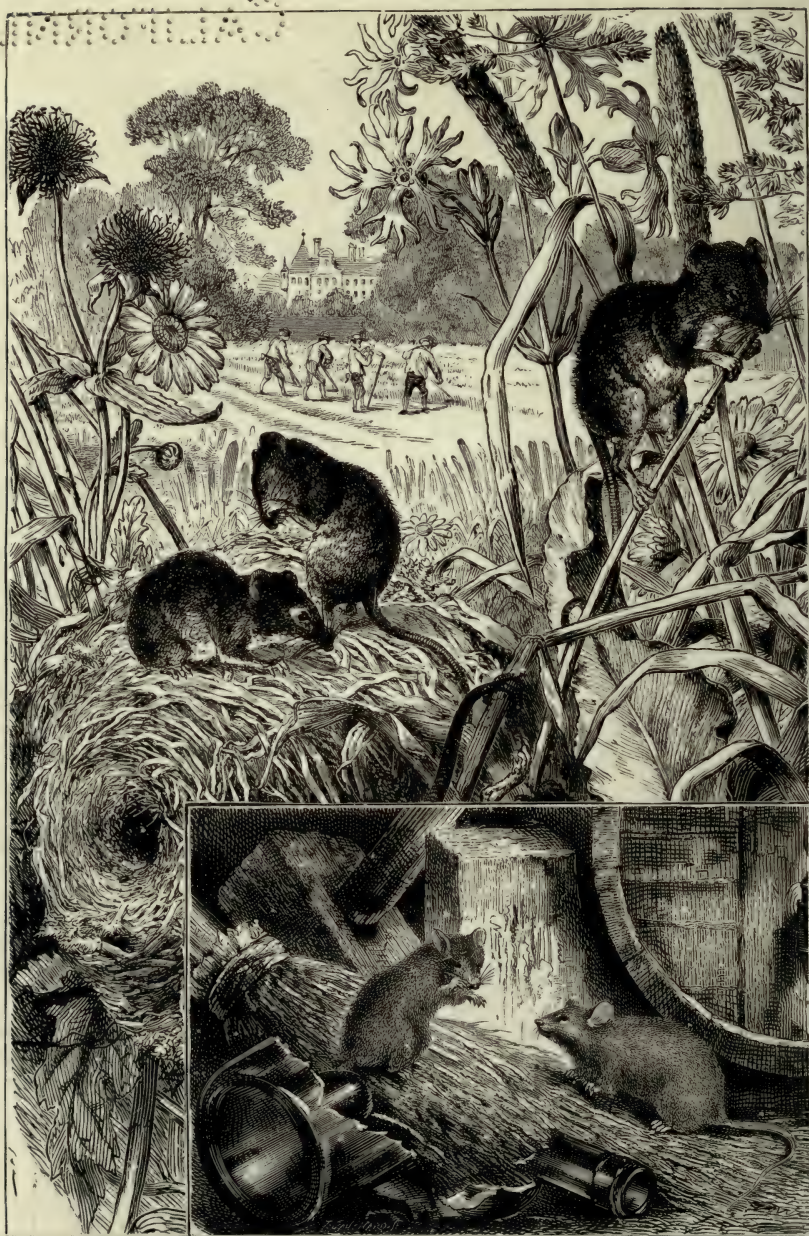


1. FIELD VOLES.

(See page 230)

2. PRAIRIE DOG.

(See page 218)



1. HARVEST MICE.

2. HOUSE MICE.

(See page 223)

HARVEST MOUSE (*Mus minutis*).

Plate XXIII. Fig. 1.

Except for the pigmy shrew the Harvest Mouse is the smallest of the mammals, as it certainly is the prettiest of all those found in the British Islands. It is only about two and a half inches long from the nose to the tip of its tail, and it is less than a quarter of an ounce in weight. The colour of its fur is a delicate yellowish red, with white on the under parts; the two colours are separated by a well-defined line. All mice and rats are good climbers, but the Harvest Mouse is easily superior to all others. It holds on to a grass stem as firmly as if the tiny paws were those of a monkey, twisting its partly prehensile tail around it. The stem may bend over until it reaches the ground, but the little climber will not be displaced.

Gilbert White was perhaps the first naturalist to take particular notice of the habits of the Harvest Mouse. Says he: 'They breed as many as eight at a litter, in a little round nest composed of the blades of grass or wheat. One of these nests I procured this autumn, most artificially plaited, perfectly round and about the size of a cricket ball, with the aperture so ingeniously closed that there was no discovering to what part it belonged. It was so compact and well filled, that it would roll across the table without being discomposed, though it contained eight little mice that were naked and blind. As this nest was perfectly full, how could the dam come at her litter respectively, so as to administer a teat to each? Perhaps she opens different places for that purpose, adjusting them again when the business is over; but she could not possibly be contained herself in the ball with her young, which, moreover, would be daily increasing in bulk.'

In winter the Harvest Mouse retires to its burrow, where it lies in a state of torpor. But in harvest-time vast numbers of them are transported in the sheaves to the rickyards, where they join the common and the field mice. Perhaps it is owing to an entirely mistaken sense of gratitude that the Harvest Mouse in a rick does not hibernate.

DORMOUSE (*Muscardinus avellanarius*).

Plate XXIV. Fig. 1.

Although belonging to another family we will here consider the Common Dormouse, rather an elegant little animal only two and a half inches in length, with a bushy tail quite as long. It is not a true mouse, but appears to be about intermediate between the squirrels and the mice, with a nearer affinity to the former. It is confined to the temperate and colder regions of the Old World, and, for example, is not found in Southern Europe.

In body it is plumper than the common mouse, and its nose is less acute. Its coat is mainly reddish brown; it is lighter underneath and almost white on the throat. Its tail is more hairy as it approaches the tip.

The Dormouse inhabits woods or thick hedges, making a nest of woven grass in the hollows of tree-trunks or near the roots of close shrubs. Instead of being diurnal like the squirrel, the Dormouse is nocturnal. It eats nuts and seeds, although it does not disdain an insect that comes its way. It is particularly fond of hazel nuts, extracting the kernels without removing them from the stems or even from their cups. Hence the name 'Hazel-mouse' which the animal bears in Germany.

As winter approaches the Dormouse commences to collect a store of nuts, acorns, &c., to serve it when it wakes at intervals in its long sleep. With the arrival of the cold weather it rolls itself up in its winter nest and falls into a lethargic state. Both summer and winter nests are frequently found, to the number of a dozen or more, in the same thicket.

A larger European specimen is the Loir, or Fat Dormouse (*Myoxus glis*), with its habitat in the Southern countries and extending into Asia. It attains a length of six inches with a tail three-quarters as long. It is said to add small birds and smaller animals than itself to its professedly vegetable diet. The Loir is eaten by the Italians, only following the old Roman epicures, who specially fattened the little animal for the table.

BLACK RAT (*Mus rattus*).

Plate XXIV. Fig. 2.

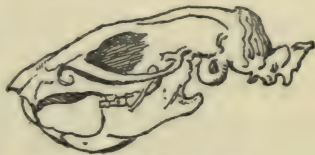
Any species of true rat may be best described as a large mouse with its powers of destruction developed out of all proportion to its size. The Black Rat, or Old English Rat as it is called, is often stated to be indigenous to Britain, but there is little doubt that the animal was introduced into Europe from the East. It is now comparatively scarce in this country, but on the Continent it is still widely dispersed.

The Black Rat is about seven inches long, with a tail as long or even longer. Its upper parts, in colour, are deep iron-grey, bordering upon black; the under parts are lighter. The feet, dirty pale flesh-colour and practically destitute of hair, differ in one important particular from those of the mouse. The hind feet can be turned right round, and with the claws thus at the back the animal can walk up a rough wall or fence, or come down it head-foremost. Like most of the genus, it holds its food in its fore paws.

BROWN RAT (*Mus decumanus*).

Coloured Plate XIV. Fig. 1.

The Brown Rat is often called the Norwegian Rat, under the mistaken idea that the animal was imported into this country from Norway. It is really a native of China, that in the short space of two centuries has not only spread across the whole of the Eastern Hemisphere, but by means of shipping has been carried into every part of the world. It is authentic that in the year 1727



SKULL OF THE RAT.

immense swarms of Brown Rats swam across the Volga to make their homes in Eastern Europe, and twenty years later the rodent usurper was established in England. But the outstanding feature of the Western invasion by the

Brown Rat is the manner in which it has made war upon the black species, which it has practically exterminated in England and many parts of the Continent.

The Brown Rat is two inches longer, and is of heavier build than its black relative; its muzzle is blunter, ears smaller, and tail shorter than the head and body. In colour it is greyish-brown, but the shade varies considerably.

The chief character of the Brown Rat is undoubtedly its astonishing voracity. There is no human food that it will not eat greedily. Provisions of all kinds are ruined, ricks and grain-stores are looted, hen-roosts are robbed of their eggs and young chicks, and rabbit warrens of their young. In the summer the pertinacious Rodent will betake itself to the fields, making its home in the hedge-banks, from which it issues to prey upon the contents of birds' nests, and almost anything that creeps or crawls that is smaller than itself. It frequently takes up its quarters in a river-bank, where it will contrive to catch fish. In such a situation the Brown Rat is frequently mistaken for the Water Rat, or Water Vole as it is more properly called.

The Brown Rat is wonderfully prolific, the female producing litters of from eight to ten young ones several times a year; and a young female will commence breeding by the time that it is half-grown. It is easy to understand how these Rodents may speedily become a pest in any locality they particularly favour. They excavate with a persistence that often endangers the foundations of buildings; they burrow through river and canal dams, often resulting in immense damage; they infest the holds of ships, and in a variety of ways they contrive to effect endless mischief.

Although the animal is omnivorous, it displays a preference for animal food. In large towns the sewers are infested by hordes of rats, which devour the animal offal and refuse, and in this respect do good service in their office as scavengers. But the creatures do not restrict themselves to offal; if they can effect an entrance into a butcher's store they will not only attack the meat, but will confine themselves to the best joints. It has frequently occurred that, from a ship, Brown Rats have obtained entry into an island, where

hitherto they were unknown. In a few years they exterminate the smaller animals and birds, and have to continue a more precarious subsistence upon the marine crustaceans and molluscs that can be picked up on the shore.

Rats always prey upon any of their kind that have been wounded or disabled ; and when food is scarce the strong inevitably prey upon the weak. No better example can be adduced than the manner in which the comparatively gentler Black Rat has succumbed to the brown species. In some cases the former have been known to confine themselves to one part of a building and the latter to another portion ; on board ship one species has kept to the fore part, while the aft has been the special domain of the other. But the ultimate result is always the same—the Brown Rats invariably devour their sable kindred.

The superiority of the brown species, and its extreme ferocity, are exemplified in an incident vouched for by the late Frank Buckland. A London rat-catcher captured several dozen rats, consisting of more or less even numbers of brown and black ones. They were intended to provide sport for some dogs on the following day. By morning, however, only Brown Rats remained—the black ones had fallen victims to the rapacity of their cannibal fellow-prisoners.

Though a rat will always attempt to escape from man and any animal not weaker than itself, it will present a savage front when brought to bay. It will defend itself to the last against man, and many cats and dogs will turn tail at its desperate onslaught. In some cases it has been known to attack persons, especially children, in their sleep.

When impelled by hunger, rats migrate in large bodies in search of food, and then, with the additional courage which numbers give, they will not hesitate to attack human beings, as a Hertfordshire farmer received painful proof. One night, in crossing a common, he encountered a body of rats, a hundred strong. Though by throwing stones at them he endeavoured to prevent their purpose, they surrounded him, some of them running up his body as high as his shoulder, and inflicting severe bites, especially upon his hands.

English rats occasionally attain a weight of more than four pounds and a length exceeding twenty-two inches. In China they are fed up for food, and are hawked about for sale. Weighing as much as seven or eight pounds, they are not at all unlike small sucking-pigs.

Rats are always found in coal-mines, securing the greater part of their living from the provender of the horses employed underground and scraps of the miners' food. At holiday times it is not unusual to bring to the surface the horses and the store of corn. Once, says Mr. Robert Stephenson, a pit was closed for a longer time than usual, and the rats were reduced to starvation. The very first man who descended to resume work was attacked by the hungry horde, and killed and devoured before his friends could descend to his rescue.

Modern science has proved that the rat is very largely instrumental in the spread of the plague, the ravages of which, for example, in India alone in the years 1906-1908 caused no less than five million and a quarter deaths. The Rodent is particularly susceptible to disease, that is conveyed to man by fleas which infest its fur. The fleas suck the blood of a plague-stricken rat, and as soon as the victim is dead they desert the cold carcass to inflict, perhaps, their next bites upon human beings, to whom they convey the plague bacillus. Although the rat has always had every man's hand against it, the constant efforts to exterminate it have generally met with failure; but the resources of science are capable of proving too much for the destructive and disease-disseminating vermin. Preparations can now be obtained which rats will greedily devour, the effect of which is to cause a deadly epidemic to rage among not only those that partake of it, but also the animals with which they mix. Dogs, cats, fowls, &c., can eat the preparation without suffering inconvenience.

FIELD VOLE (*Arvicola agrestis*).

Plate XXII. Fig. 1.

The Field Vole, or Short-tailed Field Mouse, with a body four inches long and a tail of an inch and a quarter,

bears a close resemblance to the true mice. The head is large in proportion and the body is stoutly built. It is of a reddish-brown colour, changing to grey underneath. The favourite resort of the Field Vole is damp meadows, adjacent to woods and copses, where it burrows incessantly and makes innumerable runs. The general food of the species consists of herbage of all kinds, roots, bark, buds, leaves, and fruit ; but it will dine with almost equal readiness on insects and flesh. It does not confine its depredations to the field ; it readily transfers them to the rickyard and the barn.

It is an amazingly prolific little animal, as it need be, one would think, to exist at all in face of the ceaseless toll levied upon it by weasels, owls, and other carnivorous creatures. But the Vole brings three or four families a year into the world, and exhibits a peculiarity in making its appearance in swarms in some selected locality. 'Mice plagues' have appeared in various parts of the country, usually without any apparent reason. One such visitation occurred in 1891 in the counties of Dumfries and Roxburgh in Scotland. It was suggested that gamekeepers had almost exterminated the weasels and owls, and thus the Voles had been allowed to increase without hindrance ; but in other districts that have suffered no such reason could be advanced.

In the Forest of Dean about the middle of the last century certain new plantations became so infested with Voles as to threaten destruction to the whole of the young trees. 'In the reports made to Government on the subject, it appeared that the roots had been eaten through wherever they obstructed the runs of the mice. Various plans were devised for their destruction : traps were set, poison laid, and cats turned out, but nothing appeared to lessen their number. It was at last suggested that if holes were dug, into which the mice might be enticed or fall, their destruction might be effected.' This plan was adopted, and at intervals of about twenty yards were dug holes, eighteen to twenty inches in depth, and wider at the bottom than at the top, so that the animal once in could not readily get out again. In these holes at least thirty thousand Voles were caught in the course of three or four months ; and this

without taking into account the vast number that was eaten by weasels, stoats, kites, hawks, owls, magpies, &c., which were attracted to the district.

WATER VOLE (*Arvicola amphibius*).

Plate XX. Fig. 2.

The Water Vole, the largest of the British Voles, is common in all parts of Europe and in Northern and Central Asia. The colour of the British species is a mixture of grey and brown. Its nose is more snub, the ears shorter, and the eyes smaller than those of the brown rat. It is an expert swimmer and diver, and its coat is as impervious to water as the plumage of a duck. When alarmed, it dives to the bottom, where it can remain for a minute or more before coming up to the surface elsewhere to breathe. During hard winters, when its usual food of aquatic plants is not available, the Water Vole adopts a diet of bark, to satisfy which it works much injury in osier plantations. It will also raid the 'buries' of turnips, mangolds, and potatoes in fields near the river-banks. But the animal is not so voracious as the common rat, and it is also far less prolific. Though English streams are seldom, if ever, without the Water Vole, the animal is not found in Ireland.

MUSQUASH (*Fiber zibethicus*).

Coloured Plate XIV. Fig. 3.

The Musquash, Musk Rat, or Ondatra, the largest of the Voles, is a North American species. Its range extends from the Atlantic to the Pacific, and from the Arctic regions as far South as Texas. It is a solidly built animal of a foot in length, with a tail of ten inches. It presents marked differences from the true Vole in more than its size. Besides being longer in proportion, the tail is compressed, and scales almost wholly replace the hair. The hind feet are partially webbed. The head is remarkably wide, and

there is no apparent neck. The animal is furred to its nostrils, its coat being chiefly blackish-brown with grey on the under parts, and in texture it is soft and glossy like that of the beaver. In its thick-set form and not a few of its instincts the Musquash resembles the last-named animal, with which at one time it was supposed to be closely allied.

The Musk Rat, so called from its musky odour, is a well-equipped aquatic animal. Water plants form a great part of its food, varied with fish and fresh-water mussels. The burrow of the animal is always in the bank of a stream, with numerous passages, whose entrances are always under water. In a nest in the burrow as many as five to nine young ones are born at a birth, and there is often more than one litter in a year.

For use in the winter the animal frequently constructs a dome-shaped 'hut,' either upon the bank of a river or in the stream itself upon a mound of mud, sufficient to raise it above the water. Though some writers assert that these huts are comparable to the lodges of the beaver, there is no doubt that the winter quarters of the smaller animal are little better than heaps of roots and other vegetable substances. It can burrow into them for cover and warmth, and can at the same time satisfy the claims of an appetite that is always more or less obtrusive.

The Musquash is hunted for its fur, which is useful but not particularly valuable. Twenty years ago as many as four million skins annually marked the abundance of the animal and the assiduity of the trappers. The numbers are now very considerably smaller. Notwithstanding its musky odour, the insipid flesh of the Musquash is a constant dish with the Indians in winter.

HAMSTER (*Cricetus frumentarius*).

Coloured Plate XIV. Fig. 6.

The Common Hamster, unknown in Britain, is found throughout Central and Eastern Europe, and in Central and Northern Asia. It is a handsomely coloured animal just under a foot in length, with a tapering hairy tail of

two and a half inches. Its coat is brownish-yellow on the back, the under parts are chiefly black, and the feet are white; but in different regions there is considerable variation in colour, from black to almost pure white.

The Hamster is perhaps the most systematic of all the burrowers. Its winter quarters, in particular, are of quite elaborate construction. The spacious dwelling-chamber is one or even two yards deep, with an almost vertical hole for an entrance and a gradually ascending tunnel for an outlet. The males and females and young ones use separate burrows as they do separate storehouses; of these last a male will sometimes construct three or four. Breeding twice a year, with families of six to eighteen, in favourable localities the Hamster increases rapidly and works immense injury to crops.

The animal is by no means a vegetarian, but will kill and eat smaller animals, including those of its own kind. There is no vegetable substance that it will not devour; but corn, peas, and beans are chiefly what it stores up for winter use. It conveys its spoils to its burrow treasury in its cheek pouches, which are of a half-pint capacity. The injury that Hamsters may work to agriculturists can be easily gauged from the fact that a single animal will hoard a couple of bushels of wheat, and of beans still more.

Hamsters hibernate from October to at least the end of January. When they awake they do not leave the burrow, but for some weeks subsist upon the stores they accumulated during the previous autumn. Peasants go Hamster-hunting in the winter, the net results of which consist of skins and no inconsiderable quantity of hoarded grain.

LEMMING (*Myodes lemmus*).

Coloured Plate XIV. Fig. 2.

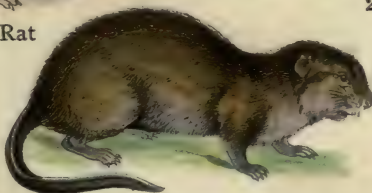
The Lemming is another Vole-like animal, about six inches in length, including its half-inch tail. It is an inhabitant of the northern regions of both hemispheres, the European species figured in the illustration being the largest. In Scandinavia, where it is best known, it abounds



1. Brown Rat



2. Lemming



3. Musquash



4. Squirrel



5. Squirrel Lemur



6. Hamster



7. Marmot



8. Jerboa



9. Beaver

70 x 100
Ampere

in the mountains beyond the belt of the firs, where it feeds upon the mountain herbage, roots, &c. Even in winter it does not cease its activity, but burrows under the snow, where it can at least find lichens.

For a small animal the Lemming is remarkably courageous, not hesitating to bite at the legs of men who approach too closely to its burrows. It must be one of the most prolific of the Murines, for at irregular intervals of ten to fifteen years the creatures descend from the mountains literally in millions. The migration may be caused by an unusual multiplication of their numbers, a deficiency of food, or perhaps by an instinctive knowledge of an approaching severe winter. Either of the reasons is only surmise, but the migration itself is a fact that the inhabitants in its line of march know to their grief.

The hordes of Lemmings move chiefly at night or in early morning, and no obstacle can deter them. The herbage in their course is licked up as though by flame; growing crops disappear with heart-breaking rapidity, corn-ricks are reduced to heaps of chaff. They swim rivers and lakes; they swarm through towns, filling wells and polluting the water, so that frequently after the visitation the people are stricken with a form of typhoid called 'Lemming fever.' All along their route the plague of Rodents is accompanied by clouds of birds and hosts of beasts, which prey upon them without ceasing, and the inhabitants adopt all kinds of plans to lessen their numbers. But on and on the countless pilgrim Lemmings sweep over the land, day after day and week after week, until they reach the coast. This is inevitably the end of the migration; the final stage is always either the Atlantic or the Gulf of Bothnia. The already lessened host unhesitatingly plunges into the sea, and the Scandinavians know that the costly scourge is at an end.

In olden times the people superstitiously believed that the Lemmings fell from the clouds, and the clergy were called on to exorcise the myriad-footed demon. The Turks under similar circumstances pin their faith to holy water from Mecca, which is sprinkled on the ground in the hope that it will abate a Vole plague.

There still remain many species of Mouse-like Rodents that are not without interest, but space forbids even the bare enumeration of more than a few, and those chiefly whose distinguishing characteristic is indicated in their name :—

The Mole Rat, ranging from the south-east of Europe to Persia ; the Fish-eating Rat of Peru, with its webbed and fringed hind feet ; the Naked Sand Rat of Somaliland, about the size of a mouse and much resembling a tiny, hairless, but lively puppy ; and the Spiny Mouse (Plate XXV. Fig. 1) of Syria and East Africa, which is something like a diminutive hedgehog. The Kangaroo Rat is not an Australian animal, as one might be led to suppose, but is one of a family that is confined to the New World. Its distinctive features are the possession of hair-lined cheek pouches and kangaroo-like hind legs, from which last it is but a natural step to the concluding family of the Murines.



SKELETON OF THE
JERBOA.

FAMILY DIPODIDÆ (JERBOAS).

JERBOA (*Dipus aegypticus*).

Coloured Plate XIV. Fig. 8.

The Jerboa is of rather wide habitat, for it is found in the South-east of Europe, Central Asia, India, and Ceylon ; from Syria and Arabia it extends to Egypt and a great portion of Africa. It is a small Rodent, almost bird-like in aspect, six to eight inches in length, with a tufted tail longer than its body. Its home is largely in desert regions, and the fur of the Jerboa is generally of a sand colour. The animal's most marked feature is the disparity in length between its fore and hind legs. Only three toes of the hind foot are well developed, but the sole is fitted with elastic pads. The hind limbs alone are used for progression, and

it skips over the ground with such astonishing bounds as to seem to fly instead of leap. So great is its speed that it is difficult for the eye to follow its movements. The Jerboa feeds upon such grasses and roots as arid regions afford. The animals dwell in companies, excavating burrows with branching galleries, into which they retreat at the least alarm, and from which in any case they seldom emerge except at dusk.

CAPE JUMPING HARE (*Pedetes caffer*).

Another species of the family is the Cape Jumping Hare, very similar in build to the preceding animal; but the tail is bushy, and the toes of the hind feet are provided with hoof-like nails. In size and colour the animal is much like the common hare. In making its kangaroo-like progress the Jumping Hare will clear as much as thirty feet at a leap.

PORCUPINE-LIKE RODENTS.

FAMILY HYSTRICIDÆ (PORCUPINES).

PORCUPINE (*Hystrix cristata*).

Coloured Plate XIII. Fig. 3.

These rather large Rodents are extraordinary animals, as evidenced by their French name, Porcupine, the literal meaning of which is 'spiky pig.' The common species is nearly three feet in length. The head and fore part of the body are clothed with short spines with a crest of longer ones; the hinder part is covered with sharp pointed quills, a development of the hair, even greater than that in the hedgehog.

The Common Porcupine is a native of Southern Europe and Northern and Western Africa; and there are various species in other parts of Africa, in India, and in the New World. At one time it was believed that the animal possessed the power of flinging its dart-like quills at an antagonist, and there is no doubt that leopards, and even tigers, have been

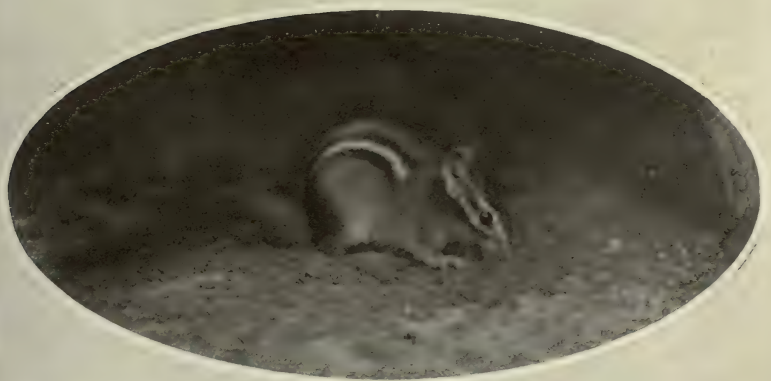
found dead with Porcupine quills piercing their nostrils and muzzles. Getting one's 'back up' is an expressive term often applied to human beings when labouring under great irritation. When the Porcupine is in its normally placid humour the quills lie smoothly along its back; but when it is attacked it erects its panoply of spines and runs backward against its foe. The strangely clothed Rodent sheds its quills periodically, and some of them are always more or less loose; and when they pierce an enemy's skin they remain there. Casual observation would lead one to suppose that such a weapon would not seriously injure a leopard, and in reality if the quill were withdrawn the great feline would think little of the wound. But try as it will the animal cannot get rid of the dart, for it carries projections which not only foil all efforts to remove it, but assist it to work its way further and further into the tissues, until inflammation sets in and the animal dies of hunger. As a matter of fact one of the large carnivores is in little danger of meeting with such a fate, for one stroke of the paw upon the head would effectually dispose of the Porcupine, even before it could roll itself up into a ball for protection.

The Porcupine is a nocturnal animal living in a burrow, which it excavates with its long and powerful claws, and wherein it lies in winter in a torpid state. Roots are its staple food. The animal is not so clumsy as its appearance would seem to indicate. It is as quick on its feet as it is sharp of eye; and three or four natives armed with spears can rarely despatch the animal without their bare legs showing traces of its swift offensive movements. Dogs are usually trained to hunt the Porcupine, and their concerted movements speedily bring about its undoing. While the baited Rodent is endeavouring to injure its foes on its flanks and rear, one of the dogs will dart at its defenceless head and disable it by a single bite.

Unlike those of the Old, the New World Porcupines are tree-climbers, various species of which range over the greater part of America that lies between Mexico and Paraguay. They usually possess a partly prehensile tail.

The Urson or Canadian Porcupine (*Erithizon dorsatus*), Plate XXV. Fig. 2, is the only species found so far North,

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1. DORMICE.

(See page 226)

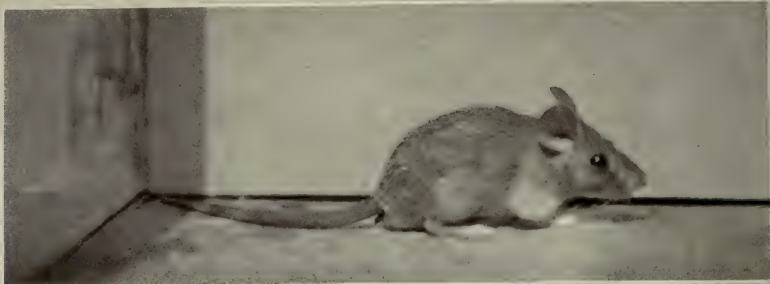
2. BLACK RAT.

(See page 227)

3. CHIPMUNK.

(See page 216)

(Photos W. S. Berridge, F.Z.S.)



1. SPINY MOUSE.

(See page 236)

2. TREE PORCUPINE.

(See page 238)

3. VISCACHA.

(See page 240)

but its habitat includes practically the whole of the United States. Indians call it the Cawquaw. Though it lacks a prehensile tail, it is an adept at climbing, stripping trees quite bare of the leaves, especially hemlocks, of which it is particularly fond. The animal does not hibernate, but in winter lives upon the bark of young trees. A single Porcupine will thus be responsible for the destruction of hundreds of trees between autumn and spring.

The Urson is the creature which furnishes the quills with which the Indian squaws embroider moccasins, leggings, pouches, and other objects of use or ornament.

Porcupine quills for use as penholders, fishing-floats, &c., are chiefly the product of the European species, and as the animal is by no means common, the quills are expensive.

FAMILY CHINCHILLIDÆ (CHINCHILLAS).

CHINCHILLA (*Chinchilla lanigera*).

Coloured Plate XIII. Fig. 2.

The Chinchilla is only about ten inches in length, exclusive of its tufted tail, which is four or five inches long. It is an elegant, active little creature, with its hind legs longer than the anterior pair. It was at one time classed with the jerboas. In size and general form it is not unlike a rabbit, with a squirrel's tail. It inhabits the Andes of South America at considerable elevations, as do the marmots in the Alps.

Chinchillas live in large companies in burrows, where they appear to breed all the year round, which helps the creatures to keep pace with the demand for their skins. The fur is thick and exceedingly soft, of a delicate grey on the back and greyish-white beneath. It is much admired when made into muffs, boas, cloak-linings and other wear for ladies. Like all animals whose coats are of very fine texture, the Chinchilla is a particularly clean creature. Its agility is remarkable, and it darts up and down precipitous walls of rock with the utmost rapidity. The natives in hunting the little creature call

into service a species of weasel, which enters the burrows and drives out the occupants.

Of several somewhat similar species, one, the Viscacha (*Lagostomus trichodactylus*), Plate XXV. Fig. 3, is a decidedly more marmot-like creature. It is a plain dweller, larger, and with a more varied coat than the Chinchilla proper. It abounds on the pampas of Southern Argentina, where it has a better choice of food than can be found at high altitudes. Very often the Viscachas do much damage in cultivated fields. While a party is engaged in a foray, sentinels are posted to give the alarm at the least appearance of danger, and in a flash all dart off to take refuge in their holes.

FAMILY DASYPROCTIDÆ (AGOUTIS).

AGOUTI (*Dasyprocta aguti*).

Coloured Plate XIII. Fig. 7.

The Agouti, a beautifully formed Rodent, is about the size of a rabbit; and in its swift, active, watchful movements it is not at all unlike that animal. The Common, or Golden, Agouti will serve as an example of any member of the family, which all more or less resemble each other in form and habit. It is found almost throughout all South America, but its home is chiefly in the forests of Brazil, Guiana and Peru.

The animal is usually eighteen to twenty inches in length from the tip of its nose to its pointed and mere stump of a tail, and its compact body is supported on four slender legs. Its coat consists of coarse hair, olive brown in colour, the longer hairs on the hind quarters merging into a shade of bright orange.

The Agouti is nocturnal, hiding itself by day in the hollows of trees, or in burrowed cavities two or three feet deep at their roots. Often a score or more of the animals will live peaceably together, frequently wandering miles from home, which is an unusual feature with most burrow-

ing animals. The food of the Agouti consists chiefly of herbage, roots, and fallen fruits ; nuts present no obstacle to the sharp incisor teeth. When the animal is found in the neighbourhood of sugar and other plantations its raids lead to considerable damage, which has caused planters to hunt the animal more than otherwise would have been the case. In some of the West Indian Islands it has been almost exterminated. Young Agoutis are no uncommon pets in South America.

FAMILY CAVIIDÆ (GUINEA PIGS).

GUINEA PIG (*Cavia cobaya*).

Coloured Plate XIII. Fig. 1.

The best known representative of the Cavies is the animal commonly and absurdly called the Guinea Pig ; the correct title is Guianan Pig, the creature being a native of Guiana. There are no species of the animal in Africa, so that 'Guinea' is distinctly out of place. The Cavy is a tailless animal, six or seven inches in length, with a coat marked by its variety of colouring, irregular patches of orange and black upon a white ground being not the least beautiful. The Common Guinea Pig is doubtless the descendant of a wild species that was first domesticated by the Incas of Peru, and introduced into Europe by the Dutch.

The Guinea Pig is exceedingly prolific, producing litters of as many as ten young ones at intervals of less than three months. The young are wonderfully developed at the time of their birth ; not only can they see, but they possess their second set of teeth. In a few hours they can run about, and before forty-eight hours have expired they are nibbling not only soft food, but corn. Immense numbers are reared in Europe, chiefly as pets for children, for though the creature displays little intelligence, nor evinces affection for its owner, it is very cleanly, and never attempts to bite those who handle it.

CAPYBARA (*Hydrochærus capybara*).

Coloured Plate XIII. Fig. 5.

The Capybara, Carpincho, or Water-Hog is the largest of the Rodents, attaining a length of three or four feet, and possessing a very thick body, short legs, and long feet. Its solidity is shown in its weight, for it often scales very little short of a hundred pounds, or very nearly twice as much as a very large beaver.

This big Cavy is covered with long, brown, bristly hair; its tail is but the merest stump. It is found chiefly on the banks of South American rivers, and its half-webbed feet fit it for an aquatic life. It swims and dives well, and, very much like the otter, it can catch fish to add to its ordinary vegetable diet. The molar teeth of the Capybara markedly resemble those of the elephant; they are of special service in pulping the vegetable food upon which it feeds, so that the food will pass down its remarkably narrow gullet, which is so small that it will barely allow the passage of a crow quill.

The Capybaras frequently go about in herds of as many as twenty, concealing themselves amid the reeds and rushes that fringe the streams. When alarmed they take to the water, only just showing the upper parts of their heads. They are listless, almost stupid animals, and even the female and its young of half a dozen indulge in no sportive capers. The native Indians eat the flesh of the Capybara, but it is the jaguar that keeps down the numbers of the animal, which forms a large part of the ordinary food of the 'American tiger.'

Sub-Order 2.—DOUBLE-TOOTHED RODENTS**FAMILY LEPORIDÆ (HARES AND RABBITS).****HARE** (*Lepus Europæus*).

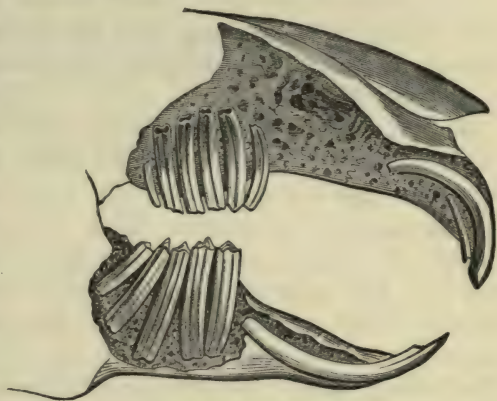
Coloured Plate XIII. Fig. 6.

The Common Hare, widely distributed in Europe, is the largest and the most perfect type of the whole family.

An animal so well-known requires little description save for comparison with some thirty other species, most of which are confined to the Northern Hemisphere. In the whole of South America, for example, there is but the Brazilian Hare.

The Common Hare is about two feet long and clothed in reddish-brown fur, with white upon the chin and belly. The tips of the ears are blackish, as is the top of the short tail. The hind legs are longer than the fore limbs and the feet are hairy. It possesses the distinguishing feature of the sub-order, viz., four incisors instead of two in the upper jaw. A full-sized animal will weigh eight or nine pounds.

All the members of the family are markedly shy and timid; their sole means of defence is their speed. The ears are longer than the head and adapted to catch the slightest sound; the eyes are large and prominent, and said to be open even when



JAWS OF THE HARE.

the animal is asleep. In any case they are placed so that to a great extent the animal can see backwards while it is on the run forwards.

The Hare prefers dry flat grounds, where it feeds chiefly by night, during the day lying concealed in its 'form.' It is a strictly herbivorous animal, its food consisting of a variety of herbage, but it is very fond of young corn, and sometimes, especially in winter, ruins plantations of young trees by gnawing off the bark as high as it can reach.

In quite early times the Kings of England enacted game laws which assured to the owners of land certain animals and birds found thereon. For one of the common people to be detected killing a deer entailed the loss of the culprit's

hand, or even having his eyes torn out. The best known 'game' are pheasants, partridges, grouse, and Hares. A Hare may only be killed during certain months by a licensed sportsman, and it can only be sold by a licensed dealer.

The Hare often contributes to sport in other ways. When hunted by hounds, though the animal is really speedier than the fox, it does not display such good generalship, usually exhausting itself in its earlier efforts; but it frequently displays considerable cunning. It will take refuge in a sheep-fold and hide among the sheep; it will run up one side of a hedge and down the other; it will swim a stream; and it has been known to gain the top of a newly cut hedge and then to run along it for a considerable distance to throw its pursuers effectually off the scent.

The Hare has many enemies. No dog with the sense of smell can resist the desire to track it; the weasel tribe are ever on the watch for it; and birds of prey and snakes leave it no peace. Man always hunts it assiduously. It is a wonder that the creature can contrive to exist in any numbers: and but that the female produces several litters in the course of the year and that the animal is so strictly preserved, the Hare would become exceedingly scarce in Britain. The fecundity of the animal has been tested by placing a male and two females in a walled enclosure. At the end of twelve months there were no less than forty-seven animals awaiting their freedom. Out in the open the net result would have been far less, for these particular animals were freed from the attentions of their natural foes. Young Hares, which are called 'leverets,' are born clothed and with their eyes open.

The flesh of the Hare, which is dark in colour, is greatly esteemed in most countries, but it was a forbidden animal to the Jews and Mahometans. The Mosaic law included it among the unclean animals 'because he cheweth the cud, but divideth not the hoof.' The Hare has neither the teeth nor the stomach of a ruminant; but in early times it was supposed to chew

the cud, when it was but moving its jaws about in the constant endeavour to keep down the growth of the incisor teeth.

Large numbers of Hares which are sold in our home markets are in reality the Mountain Hare (*Lepus timidus*), which abounds in North America, Northern Asia, and the North of Europe, especially Russia, from which we import vast numbers. They are excellent in the eating, but do not realise the price of the British species.

Hareskins vary in colour largely according to the climatic conditions; the Northern species are uniformly lighter, grey in summer and almost white in winter. The Arctic Hare (*Lepus glacialis*) is wholly white, except for the characteristic black-tipped tail. Until silk largely displaced it, the fur of Hares and rabbits was of particular service in the manufacture of hats. The skins are converted into caps, cheap muffs, and the linings of cloaks; whether the fur is not passed off as the product of more fashionable animals is best known in trade circles.

WILD RABBIT (*Lepus cuniculus*).

Coloured Plate XIII. Fig. 4.

The Rabbit is less in size than the hare, smaller in the body and shorter in the leg, but there is less disparity in length between the hind and fore limbs. The ears of the wild Rabbit are only about as long as the head, and they are tipped with black. The fur is greyish-brown, becoming whitish on the under parts; the tail is rather large and conspicuous, brown above and white below, and it is usually held upright. Notwithstanding their marked similarity, the Rabbit and the hare are very distinct, never associating together or producing a mixed race of descendants.

The Rabbit is an inveterate burrower, preferring to take up its quarters in sandy heaths or dry grounds covered with bushes; the burrows of a Rabbit colony form a 'warren.' The animal is exceedingly prolific, commencing to breed when it is but six months old, and having families several times a year.

In 1850 a gentleman set half a dozen Rabbits at liberty in New South Wales. Long before the end of the century the south-east of Australia was suffering from a Rabbit plague. Weasels and mongooses were introduced to check the pest; but while they had little or no effect upon the Rodents, they played sad havoc in the hen-roosts of the colonists, not proving a cure, but rather an additional nuisance. Attempts to exterminate the Rabbits by infecting them with disease germs had to be abandoned, because some of the domestic animals were liable to infection. Some areas had to be given over altogether to the Rabbit, and everywhere cultivated tracts had to be protected by



SKELETON OF THE RABBIT.

(About one-sixth natural size.)

rabbit-proof wire fencing. New Zealanders met with the same troublesome experience.

Nowadays we hear less of the Rabbit pest, but we do know that New South Wales and Victoria, in a single year, export to the Mother Country twenty millions of Rabbits, frozen or tinned,

worth nearly half a million sterling, together with myriads of skins for manufacturing purposes. New Zealand sends Rabbits for our dinner tables to the value of a quarter of a million pounds, as well as immense quantities of skins. It is not always that a plague can be turned to such a golden account.

The flesh of the Rabbit is good and acceptable food, and enormous quantities come into the British market in addition to the supplies of the home animal. The sandy shores of Ostend, for example, afford a fine breeding-ground for a large-sized variety, which is exported to England at the rate of several hundreds of tons per week.

Rabbit skins are of great commercial value, for they can

be converted into all kinds of warm and cheap clothing. Vast quantities of skins are stripped of their fur, which is mixed up with some sticky substance into a glutinous mass, and then pressed into felt.

TAME RABBIT.

Of the tame Rabbit there are at least a dozen well-recognised varieties, which were probably derived from as many different countries. They vary considerably in colour, which is a common feature in animals that have been called from a wild state to lead an artificial life.

One of the hardiest and strongest of fancy Rabbits is the Dutch—a variety which, notwithstanding its small size, is greatly admired. In what is considered a perfectly coloured animal the fore part of the body is white, while the hinder part may be black, grey or blue, &c. No dark hairs should encroach upon the white, and no light hairs should show upon the coloured part. The head and ears are dark; the face is marked with a white blaze; and the feet and tail are white.

The Angora, looking more like a ball of fluff than anything else, is one of the daintiest of Rabbits. The head is broad and massive; the creature's eyes are pink; and the ears are small and well tufted. The beautiful, silky white coat needs to be parted along the back and brushed downwards on either side, to prevent the fur becoming tangled.

A prime favourite with fanciers is the Lop, whose chief point is its tremendous ears. Show animals often have ears that drop evenly on either side of the head, and measuring twenty inches from the tip of one ear to the extremity of the other; the width of an ear will not be less than four and a half inches. In colour Lops are usually some shade of fawn, bright orange fawn being the most popular. A full-grown buck of this variety will weigh quite twelve pounds.

The Himalayan has a soft, white, glossy coat, with the nose, ears, feet and tail, black. The small ears are erect. The ideal life for this variety is in a warren, where it retains

the spotlessness of its white coat far more perfectly than when it is cooped up in a hutch.

The Flemish Giant will weigh anything up to eighteen pounds. It has a big head, a large dewlap and sturdy legs. The fur, soft and standing out, gives the rabbit an appearance larger than it really is. Usually the colour is steel grey interspersed with black-tipped hairs.

PIKA.

The Pikas form the second family of the Double-toothed Rodents. They are often called tailless hares. One species is found in North America, and several inhabit the Himalaya and neighbouring regions ; but the best known is the Siberian Pika (*Lagomys alpinus*), which extends into Eastern Europe. It is rather a pretty little Rodent, smaller than a rabbit. In habits it much resembles the marmot, living in burrows, the entrances to which may sometimes be counted by the thousand. When only in pairs or small parties they sometimes occupy the crevices of rocks. Inhabiting elevated, cold, and arid regions, which are under deep snow for several months in the year, the Pika does not hibernate, but stores up food for winter use. The animal is not on the list of the Siberian fur-hunters, who content themselves with using the creature's winter store of dried grasses, roots, &c., as provender for their horses. The Pika, however, is not short of enemies, for various wild animals of the cat and dog tribes, together with the eagle, falcon, and owl, ceaselessly prey upon it.

Chapter IX

ORDER VI.—UNGULATA (HOOFED ANIMALS)

SUB-ORDER 1.—HYRACOIDEA

SUB-ORDER 2.—PROBOSCIDEA (PROBOSCIS BEARERS)

SUB-ORDER 3.—PERISSODACTYLA (ODD- TOED ANIMALS)

General description of the Ungulata —
Sub-order 1. Hyracoidea — Syrian Hyrax —
Sub-order 2. Proboscidea — Elephant — Sub-
order 3. Perissodactyla — General description
of Rhinoceros family — Indian Rhinoceros —
Other Asiatic species — African Rhinoceros —
Tapirs — Family Equidæ: Horse — Wild Ass
— Domestic Ass — Zebra — Quagga.

CHAPTER IX

Order VI.—Ungulata (Hoofed Animals)

IT is impossible to overestimate the importance of this order, if only because all the domestic animals, which are used as food, are Ungulates. Among the preceding animals many have been described as eatable, but it is safe to assert that the ordinary reader, except in the case of hare and rabbit, has never partaken of the flesh of any one of them. Native trappers and even white hunters will cook the best portions of an animal which they have killed, chiefly because no better flesh is available; and always in thinly peopled countries the natives largely supply the family larder with the flesh of animals that are found in their particular region. But civilised man, and even the savage more often than not follows his example, rears vast numbers of cattle, sheep, goats, and pigs, wherewith to meet the demand for flesh, which forms an important part of the daily food.

The Ungulates, which are all vegetable feeders except the pig and the peccary, include the largest of all the mammals, save only the whale and the sea elephant. All the 'clean animals' belong to the order, *i.e.*, those which 'chew the cud and divide the hoof.' So do some of the animals which were 'unclean' under the Jewish law, but since we have been liberated from the Mosaic law by Him who 'cleansed all meats,' they are nearly as useful to us as the clean animals. Such are the swine, the horse, the ass, &c.

The name Ungulata is derived from the Latin word

ungula, which signifies a nail, claw, or hoof. These animals fall rather easily into various smaller groups or sub-orders.

Sub-Order I.—HYRACOIDEA

FAMILY HYRACIDÆ.

SYRIAN HYRAX (*Hyrax syriacus*).

Coloured Plate XIII. Fig. 8.

The Hyrax is a remarkable little mammal that has greatly puzzled zoologists. It was formerly accounted one of the Rodents, and in its small size, thick fur and general appearance, it appeared to be well qualified for the position. It is, however, so nearly related to the Pachyderms, or thick-skinned animals, that some naturalists would unite it with the elephant in a single order of their own.

Place a Hyrax and an elephant side by side and apparently no two animals could less resemble each other. The Hyrax, in size and coat and toes, greatly features the rabbit; and it lives among the rocks, flying about with the agility of a squirrel in a tree. Indeed, there are some species that are tree-dwellers.

Yet upon examination we find that the toes of the animal are little hoofs, united by skin to the very nail, as in the elephant and rhinoceros. The teeth are of the hippopotamus type. Cuvier said that excepting for the horns the Hyrax is 'a rhinoceros in miniature.'

The Syrian Hyrax is the 'coney' of the Bible, the little animal who is 'exceeding wise' though a 'feeble folk.' It exhibits wisdom in a wariness that makes it a matter of difficulty to catch it, even when it leaves the rocky clefts in which it makes its home, and with which its colour so agrees as to make it not easy to detect it. But it does not chew the cud, as the Jews believed, a mistake that was repeated by the traveller Bruce in much later times.

There are over a dozen species in addition to the one above. The Cape Hyrax (*Hyrax capensis*) is well known in South Africa, where the Dutch colonists called it the

Klip-das or Rock Badger. Similar species are found in Abyssinia, but in East and West Africa are Tree Hyraces, whose habits are entirely arboreal.

**Sub-Order 2.—PROBOSCIDEA
(PROBOSCIS BEARERS)**

FAMILY ELEPHANTIDÆ (ELEPHANTS).

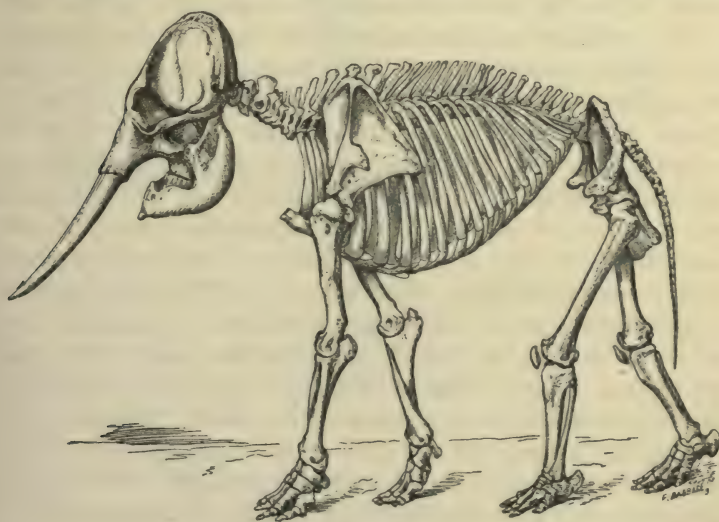
AFRICAN ELEPHANT.

Coloured Plate XV. Fig. 2.

INDIAN ELEPHANT.

Plate XXVI. Fig. 2.

The Elephant, the largest of the land mammals, is at once distinguished by its size, even if it did not possess



SKELETON OF THE INDIAN ELEPHANT.

various other marked characteristics that render it practically unique in the animal world.

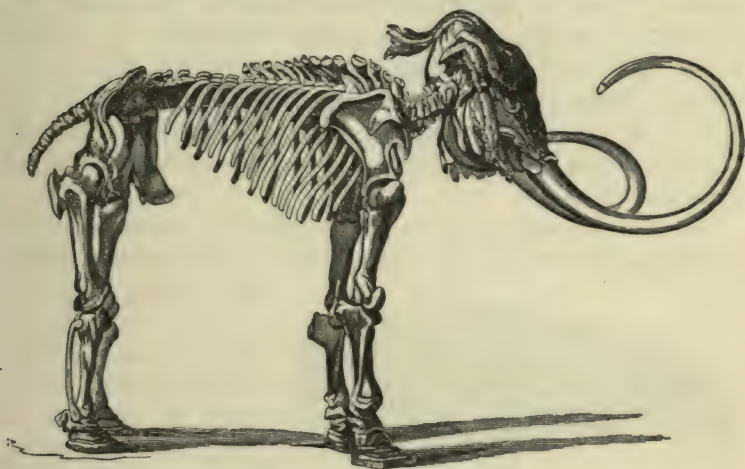
The nostrils and upper lip of the animal are drawn out into a long, flexible proboscis, at the end of which are sensitive processes that render the organ of more use to its owner than is the prehensile tail to the spider monkey. The loss of the monkey's tail would only rob the creature of a little of its activity, but the Elephant would die if deprived of its trunk. It cannot eat until the proboscis places food in its mouth ; it cannot satisfy its thirst unless the waterhose-like member takes up water and then blows it into the stomach. In short, the trunk is to the Elephant more than arms and hands are to a human being. An armless man in extremity could eat and drink in the fashion of most animals, but the Elephant would be debarred by the formation of its jaws.

The teeth of the Elephant are no less remarkable. It possesses no canines, and the incisors, limited to two in the upper jaw, are often enormously developed until they assume the form so well known as tusks ; they are deeply embedded in the massive skull, and as the tusk is worn away at the tip, fresh tooth-matter is supplied at the base.

The position and character of the limbs of the Elephant are without parallel among living animals, especially in their straightness and the absence of angulation at the joints. A glance at the skeleton of the animal will show that the construction of the legs is that best fitted to support an enormous weight, which would prove too great a strain upon angulated limbs. Yet, notwithstanding the pillar-like strength of the legs, a certain amount of activity is retained. Few persons recognise how active the Elephant really is in spite of its bulk. Shakespeare believed it possessed no joints in its legs, so that it could not lie down. But what are the true facts ? The animal can lie down, or rise again, as easily as a dog ; it can stand on its hind feet alone, or on its fore feet alone ; on the feet of the right or the left side alternately ; and it can even stand on its head. In kneeling, the hind feet are stretched out behind, but the fore feet extend frontwards.

There are only two existing species of Elephant, the Asiatic (*Elephas indicus*) and the African (*Elephas africanus*) ; but in far distant periods when the world was

young, various colossal species roamed over the greater part of Europe, Northern Asia, and America. Fossil remains of the extinct Elephant, usually known as the Mammoth, have been dug up in England, in various parts of the Continent, and have been dredged up from the bed of the North Sea. But it is evident that Siberia at one time possessed as many Elephants, as ever did Africa before the incessant hunting for ivory caused the animal to disappear from many of the regions where it once roamed. Embedded in the ice in the north of Asia have been found the remains of Elephants with large curving tusks far exceeding in size



SKELETON OF THE MAMMOTH.

those of the present day. So often did these remains come to light that quite a large trade sprang up in fossil ivory, as it was called. In one year (1873) no less than eleven hundred tusks were imported into England; and it was calculated that within a score of years the remains of quite twenty thousand mammoths must have been discovered.

The mammoth remains are a puzzle alike to the naturalist and the geologist. Some of the frozen monsters have consisted of entire animals, with the flesh, even to the eyes, so well preserved that the Yakut dogs devour it with avidity; and in the mouth of the mammoth are sometimes found the very twigs upon which it was feeding when death over-

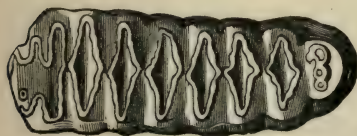
took it. It is possible that in this early period, lost to history, there may have occurred some sudden climatic revolution, a catastrophe instantly turning at least moderate heat into intense cold, with consequent death for those animals thus hurled into a terribly uncongenial environment.

Although there are points of difference between them, and the African and Asiatic species can be distinguished from each other at a glance, in most respects they are so much alike that their life-history may be taken at the same time. The ears of an Elephant are at once a sure indication of its species ; those of the African animal are of enormous size, completely covering the shoulders, and their tips falling below the neck, while the ears of the Indian species are comparatively small. The African Elephant is darker in colour, the middle of its back is flatter or hollower, and its hind foot only possesses three nails compared to the four of its Asiatic relative.

The molar teeth are of enormous size, and so deeply sunk in the jaw that they project but little above the gum. There



INDIAN LOWER MOLAR.



AFRICAN LOWER MOLAR.

are twenty-four of these cheek teeth, six on each side of both upper and lower jaws. They are never all in use, however ; only two of each half dozen are ever above the gums at any one time. The teeth are not solid, but consist of a number of plates set side by side. As

may be seen from the illustration, the plates of the African Elephant, when viewed from above, present a distinctly diamond-shaped aspect, while those of the Asiatic animal are narrow ovals.

The average size of the African Elephant exceeds that of the Asiatic, but in both species the males in particular attain immense proportions. As a rule, Asiatic elephants do not

1874. 37
C. 1874. 37



1. Rhinoceros



2. African Elephant

exceed nine feet in height at the shoulder, with a length of twenty-six feet from the tip of the trunk to the extremity of the tail ; but in the Calcutta Museum is the skeleton of an animal that was quite twelve feet in height. Jumbo, once a favourite at the Zoo, was eleven and a half feet high and weighed six and a half tons. He was of the African species, and as he was reared in captivity it is not unreasonable to suppose that wild animals may exceed even those enormous dimensions.

It is a doubtful point to what age Elephants attain ; but in captivity they have been known to exceed the century, and in their forest homes, with the advantage of strictly natural food, they might easily live half as long again. It is said that the remains of a dead Elephant are rarely met with, even in its most favourite haunts. It is suggested that the animal retires to some secret spot upon its approaching demise ; but no ivory-hunter has even been known to stumble unawares into an Elephant cemetery and a fortune at the same time.

The two species differ considerably in the matter of tusks. In the African Elephant both sexes are tusked, the only difference being that the tusks of the male are larger than those of the female, whereas in the Asiatic species the tusks of the females never more than barely protrude beyond the jaws, and not even all the males possess tusks worth mentioning. Tusks vary from one to nine or even ten feet in length, with a girth of twenty-four inches at the base, and weigh anything up to 235 lbs. A tusk of these dimensions is the exception and not the rule. Animal for animal, African tusks are not only larger, but the ivory is of better quality.

There is practically no difference in the natural habits of the Elephant, whether in Asia or Africa. It is mainly a forest-dweller, living on a diet of roots, twigs, leaves, young shoots, fruits, grass, and other herbage. It prefers to feed from trees, from the branches of which it strips the leaves with its trunk ; in eating grasses it twists its trunk round a tussock ; fruits are picked separately. In a forest the animal will work extraordinary damage. Trees that possess no tap-roots are levered up with the tusks by the roots in order to

bring the upper branches within reach, and frequently tusks are broken in the operation. The tusks are also used to grub up succulent roots.

Elephants roam about in herds of from twenty to fifty, though hunters report seeing as many as four hundred at a time. It is certain that nothing like such numbers could now be met with in Asia, and in Africa it would be unlikely, except possibly in the Kilimanjaro region, for incessant ivory-hunting has practically exterminated the Elephant in wide regions where it formerly abounded.

The eye of the Elephant is exceedingly small for an animal of its size; especially is this the case in the Asiatic species. Sight and hearing are both generally defective. The same cannot be said of the power of scent, and the hunter experiences great difficulty in approaching a herd without causing the animals to take alarm. In disposition the huge creature is naturally timid, and will take to flight rather than come to the attack. Often solitary male Elephants are met; usually they have been expelled from a herd, not adopting a lonely life from choice. In any case they are almost invariably fierce and quarrelsome, and the particular region they favour is best avoided by human beings who have no desire to make a strenuous fight for life. A 'rogue,' as a solitary bull is termed, will often do immense damage to the crops in a settled district. In fighting, the Elephant endeavours to trample on its victim with its feet or knees, while tuskers will pin down the object of their rage with their tusks.

Through no fault of its own, the African Elephant was rarely tamed and domesticated, except by the Carthaginians in their wars with Rome. In the second Punic War (B.C. 218-216) Hannibal traversed Spain and Gaul with nearly forty Elephants trained to warfare, finally crossing the Alps and inflicting defeat upon the Romans at Ticinus. The Romans used the Elephant chiefly for the purposes of sport in the arena, and it is told of Pompey that at one great festival he had no less than five hundred lions and eighteen Elephants engaged in the ring at one time. In those days the Elephant was found in North Africa; but the demand for ivory and the necessities of the

Roman arenas depleted that region, and the animal is now never found North of the Sahara.

From the very earliest ages of civilisation the Asiatic Elephant was brought under the dominion of man. The Greeks, when they invaded Persia, were filled with terror at the Elephants in their war-trappings, but in later periods made use of the animal in their various campaigns. In India the Elephant was always recognised for its strength, courage, sagacity, and generous qualities. Indian princes estimated their power by the number of Elephants they possessed, and in modern times British generals did not hesitate to press the animal into service. Powerful and hardy, no better beast exists for carrying war stores in regions almost inaccessible to ordinary conveyance. Bearing a load equal to that of sixteen bullocks, it can subsist upon leaves, whereas horses and bullocks require large amounts of fodder to be carried for their sustenance. The short, broad feet of the Elephant are well adapted for progress in mountainous regions, the flat, cushion-like soles enabling it to ascend or descend steep and difficult places with great facility.

At the battle of Goojerat, in the Punjab, in 1849, a body of Elephants dragged 20-pounder field-pieces to the centre of the lines, where they were able to work such execution as completely to break the power of the Sikhs. Even in very recent years Elephants have transported mountain-guns into districts that were otherwise inaccessible to artillery.

Useful as Elephants may be in warfare, their employment needs circumspection, as Rajah Sahib found to his cost when he tried to take the crumbling walls of Arcot, behind which Robert Clive and his small but heroic force were playing the desperate game of Empire-making. In the forefront of his attack Rajah placed a number of Elephants, wearing heavy iron spiked helmets with which to batter down the rotten gates. But the living battering-rams never reached them; they were received with such a withering fire that the Elephants turned tail and ran through their own lines with disastrous results.

There is often much misunderstanding concerning the

possibilities of the usefulness of the Elephant to man. Its ordinary pace is a walk ; it cannot trot, canter, or gallop, but it can shuffle along, under necessity, at a rate of from six to eight miles an hour. As its maximum stride is six and a half feet, a seven foot ditch stops its career completely.

The trunk is a marvellous organ of touch and smell, its wonderful mechanism consisting of nearly forty thousand muscles ; but it does not possess the strength that is often attributed to it.



SECTION OF THE SKULL OF THE INDIAN ELEPHANT.

s, Air sinuses ; *n*, Nostrils ; *b*, Brain ; *m*, Molar ; *t*, Tusk.

It can, by means of the finger-like processes, pick up an object as small as a needle, but the animal is too sensible of the value of its trunk to attempt to raise heavy weights with it. In dragging, it will hold a rope with its teeth ; and in moving weighty objects it always pushes against them with the head

or tusks. In harness, of course, it can exert enormous power.

The brain cavity of the Elephant's skull is very small, out of all proportion to the size of the animal. It is claimed that the immense creature naturally is less intelligent than the dog ; but owing to its docility and capability of receiving instruction, it can be educated to render a variety of services to man, but of its own initiative it would never make itself useful. That the animal's memory is very retentive there is no room for doubt ; it will remember acts

of kindness or cruelty for quite long periods, and will return good or ill in strict accordance with the treatment meted out to itself.

With the majority of wild animals there is usually little hope of usefully domesticating them unless they are caught when quite young ; with the Elephant it is different, for most of them are not captured until they are more or less mature. Probably the chief reason for this lies in the fact that Elephants in captivity comparatively rarely breed ; in any case the young are born singly, at rather long intervals, and great expense is incurred in their rearing before they reach an age to render their services useful.

The method of hunting and taming the wild Elephant in Asia is well worth description. In the forest where the animals are known to exist a large space is marked out and well fenced in with stakes. The enclosure, called a corral, is narrow at one end and gradually widens until it takes in a considerable extent of the forest. At the far end is a long, narrow passage leading into a still smaller space with a stout and impenetrable fence. Hundreds of men, by means of noises and the kindling of fires at regular intervals, drive the animals into the wide mouth of the staked-in area, and then one by one they are urged along until they reach the small enclosure. Here two specially trained female elephants make friends with the captive, soothing it until it allows itself to be conducted to a tree, to which it is bound by the leg. Within the space of a couple of weeks the wild Elephant is reduced to a state of subjection ; it is stabled, and quickly learns to recognise the voice of its keeper. The tame Elephants employed in the capture of their wild friends are called Koomkies, and they exhibit no small amount of sagacity in seeking to domesticate their species. A Koomky has been known to go into the forest alone, make friends with a male, and bind him to a tree without assistance ; and then in animal glee fetch her owner to view the capture which she had effected for him.

The African Elephant is seldom hunted for domestic purposes : its flesh and ivory are the main objects of the hunter, and consequently the methods employed aim at

its capture without trying to avoid injury to the animal, as is generally the case in Asia. Pitfalls are placed by the natives in the vicinity of Elephant drinking-places, artfully concealed by herbage and sprinkled with dung to give a natural effect. As soon as one animal crashes into a pit the rest of the herd will usually stampede, and, shaken out of their caution, other Elephants speedily meet with a similar fate. The pits narrow towards the bottom, and the more the huge creature struggles, the tighter it becomes wedged in the hole, to which the hunter comes and despatches his victim with ease.

The Hamrans, an Abyssinian tribe, stealthily follow the tracks of an animal until they find it asleep, or listless, as it usually is about mid-day. Creeping up to their quarry, they sever its trunk with one blow of a sword, and then wait until the creature sinks from loss of blood before finally despatching it. Sometimes the animal is rendered helpless by a cut at the sinews of the hind leg, which prevents it seeking safety in flight, and makes it an easy matter to inflict further wounds upon it.

Tracking the Elephant by its spoor is not a difficult operation in open country or even in a well-forested region; but when it frequents tracts of dense grass and reeds that reach above the animal's back, the hunter would find it less easy to locate the quarry. Unfortunately for the Elephant, it is usually accompanied by white egrets, which feed upon the ticks and other insects that infest the vast expanse of hide. And even in the densest grass or brake the presence of Elephants is indicated by the birds fluttering and hovering over their huge friends.

Shooting is the method adopted by white sportsmen; but even with the most approved weapons the chase of the Elephant is often accompanied by hairbreadth escapes. The greatest nerve and accuracy are required by the hunter, for if a shot is ineffective the wounded animal will charge down upon him with ferocious impetuosity. To be able to reach the brain it is necessary to be acquainted with the anatomy of the Elephant's skull, for, saving such points as the temple at right angles or behind the ear, there is no certainty. A bullet will often pierce the forehead of the

Asiatic species, but the skull of the African is well-nigh impenetrable.

Mr. Burchell, in his *Travels*, relates an incident well illustrating the danger of Elephant-hunting. Carel Krieger, a fearless hunter, with his party, closely pursued an animal which they had only wounded. The infuriated beast turned round and charged down upon the person who had inflicted the injury. Seizing him with its trunk, the Elephant raised its victim on high, and dashed him with terrific force to the ground. The maddened beast then literally trampled the body to pieces, finally pounding it until nothing remained but a few of the larger bones.

There is no famous hunter of modern times, even when armed with the most perfect specimen of the gunmaker's art, who has not looked death squarely in the face when in pursuit of the Elephant. Oswald, when chased by an infuriated beast, was jerked from his saddle by the thorny plants through which he madly urged his horse. Falling directly in the Elephant's path, the huge creature blundered right over the fallen hunter, without so much as touching him.

Mr. F. C. Selous once experienced a few moments each of which was punctuated with terrible thrills. The charging Elephant drove its tusk into the horse's haunch, overturning steed and rider. The next moment the hunter was underneath the belly of the Elephant, which probably thought it had destroyed its enemy. In the moment of brief respite Selous scrambled out between the animal's hind legs, secured his rifle, and with a deadly shot at close quarters brought the Elephant down where it stood. Upon another occasion a Zulu who accompanied Selous met with a terrible fate. When racing in front of a maddened animal the man fell. Before he could rise the Elephant was upon him, placing its foot on the prostrate figure, which with its trunk it literally tore into three pieces.

Mr. A. H. Neumann was not so fortunate as Selous. At a critical juncture, when he was charged by a vicious wounded Elephant, his rifle refused to act. In a moment he was thrown down. He was first stabbed through the biceps of his right arm, and a second thrust of the tusks

caught him between the ribs. At the same time the animal was pounding his chest with the thick part of its trunk, crushing in his already wounded ribs. Fortunately the beast, which was a female, either thought he was dead, or she was anxious to return to her calf, and she left him to recover from as narrow an escape as can well be conceived.

Mr. Bryden, who speaks out of the fulness of personal knowledge, says: 'The charge of an Elephant is, as even the most cool and self-reliant hunter is fain to confess, one of the most nerve-shaking experiences that any man can hope to go through. With ears spread out at right angles, like a pair of sails, screaming like a locomotive, the great pachyderm comes down upon his disturber at thirty miles an hour.' Fortunately the cool, resourceful hunter knows that a well-directed bullet will cause the blundering beast to swerve out of its path; and thus the whirlwind of flesh is avoided by, perhaps, only a few inches.

A few words may be given to the consideration of the future of the African Elephant, which in all ages has been hunted for the sake of its ivory. The average weight of cow teeth is about twenty-four pounds a pair, though in exceptional cases they may weigh from twenty-four to thirty pounds each. The finest ivories are obtained in Central and East Equatorial Africa, where the male tusks average about a hundred and fifteen pounds apiece. Exceptional specimens range much bigger; for example, Sir Edmund Loder possesses a fine tusk that measures 9 feet 5 inches over the curve and weighs 184 lbs. Probably the finest tusks known came from East Africa, measuring 10 feet 2 inches and 10 feet 4 inches, with a weight of 224 lbs. and 235 lbs. respectively. They were sold to a museum in the United States for £1,000.

Mr. Selous, the modern Nimrod without compare, shot seventy-eight Elephants in the years 1873-75, when he was engaged in ivory-hunting and the capture of natural history specimens. Upon one occasion he formed one of a party of four who shot twenty-one Elephants in a day, and once three of the same men killed nineteen out of a herd of twenty-one. Huge bags as these were, they could not

compare with the feat accomplished by three Boers. Coming up with a troop of a hundred and four Elephants, they caused the animals to stampede into a marsh, where their heavy bodies became helplessly bogged. During the day every animal was slain, a piece of wanton destruction in which neither females nor calves were spared.

Towards the close of the year 1908 news reached England that eight thousand Elephants had been rounded up in the Lado region by hunters, who were shooting the males; and that at Entebbe two hunters had obtained £5,000 worth of ivory in a four months' trip. Mr. Selous promptly ridiculed the report, stating that the largest known herds of Elephants only reached four hundred, and even that number was exceedingly rare. Ivory-hunters, too, were little likely to prefer bull tusks, which realise about twelve shillings a pound, to cow tusks, which fetch very nearly twice as much. The famous hunter declared that the Elephant is no more likely to become extinct in Africa than is the giraffe.

Within the last dozen years hunting prospects have undergone a great change in Africa and many other regions, notably India and North America. Laws have been enacted for the preservation of big game that are calculated to save many different species from the extermination that was rapidly overtaking them. In East Africa, Uganda, and elsewhere the hunter has to pay a license of £50, and even then his season's bag is limited to two bull elephants, two rhinoceroses, and a certain number of antelopes. In Burma the shooting of Elephants is very strictly regulated. Marauding 'rogues' are not protected, and may be shot on sight; but for shooting an Elephant of good character, or against whom, in the language of the police court, there are no previous convictions, a fine of five hundred rupees is imposed.

But the real danger of extinction comes from the native rather than the white man. Armed with a gun, the black man in Africa is daily and hourly stealthily hunting, with a patience that seldom fails to be rewarded; and in wild and thinly populated regions the game laws are exceedingly difficult to enforce.

Sub-Order 3.—PERISSODACTYLA (ODD-TOED ANIMALS)

Perissodactyla means uneven-toed, and included in this sub-order are only those animals that have an odd number of toes on the hind foot. There are very few species of animals possessing this characteristic—in fact, only three families. The Equidæ, or Horses, have only one developed digit on any foot ; the Rhinocerotidæ, or Rhinoceroses, have three toes on each foot ; while the Tapiridæ have four digits on the front feet, but meet the necessary qualification for inclusion in the sub-order by having only three toes on the hind feet.

FAMILY RHINOCEROTIDÆ (RHINOCEROSES).

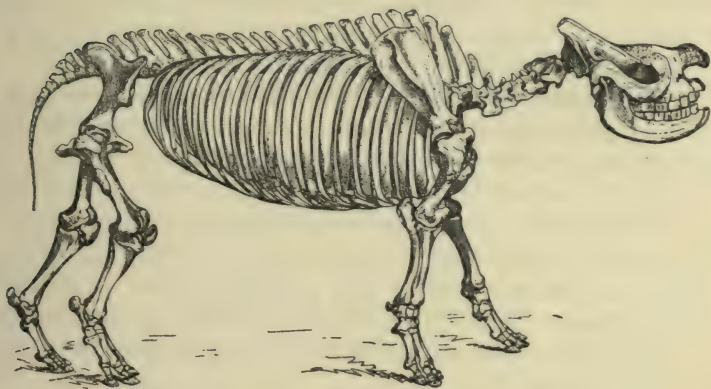
The Rhinoceros family cannot well be mistaken for any other group of animals. The word 'Rhinoceros' is formed from two Greek words signifying 'horned-nose,' and the various species possess at least one horn, while some have two. The horn has no connection with the skull ; it simply grows from the skin, from which it may be cut off with a sharp knife when the animal has been recently killed.

The family is restricted to the Old World ; several species inhabit India, Burma, and through the Malay Peninsula to the islands of Sumatra, Java, and Borneo ; and as many if not more are found in Central and Southern Africa. They are all unwieldy animals, dull, sulky, and irritable, but seldom attacking man until provoked, when they become exceedingly dangerous foes.

The figure of the Rhinoceros on its short, stout legs is not unlike that of a monstrous hog, with a big, elongated head, in which are set eyes very small in proportion. The upper lip is prolonged and is generally prehensile. The animal is always destitute of canine teeth, and the number of upper incisors never exceeds two pairs. In the lower jaw there is often a pair of large, pointed, almost horizontal tusks, with a pair of small incisors sometimes between them.

The hide of the Rhinoceros was at one time supposed to be bullet-proof. Though it is very thick and solid, the animal may be shot almost as easily as an ox. When dried, the skin is remarkably hard, and in India, particularly, it is used in the construction of shields. The skin, dense as it is, is far from being insensible, for the animal is often infested by ticks, the stings of which cause the Rhinoceros to indulge in mud baths whenever the opportunity arises. The animal is mostly nocturnal, and its food is entirely vegetable.

Notwithstanding its apparently clumsy shape, the



SKELETON OF THE RHINOCEROS.

Rhinoceros is swift of foot to an unexpected degree. When hunting the Keitloa Rhinoceros of Africa, Sir Samuel Baker found it difficult to overtake the animal, although he was mounted on a particularly good horse. The Arab hunters assured him that the Keitloa was never killed with the sword except after a long and fatiguing chase, and that even when the animal was brought to bay two hunters were required—one to distract its attention, while the other hamstrung it from behind. Even then the contest is not always ended, for the Rhinoceros can run well on three legs, and will unexpectedly turn upon its foes just when it appears to be disabled.

INDIAN RHINOCEROS (*Rhinoceros unicornis*).

Coloured Plate XV. Fig. 1.

The Common Indian Rhinoceros is the largest of the Asiatic species, and has a wide range in the south-east of the continent and adjacent large islands. Its skin, blackish grey in colour, lies in a series of folds, not unlike armour plates or shields in appearance. The first living animal seen in Europe was one that was sent to Emanuel, King of Portugal, as early as the year 1513. An average sized animal has a height of about five and a half feet at the shoulders, with the body over eight feet in length from the tip of the snout to the root of the short-tufted tail, which is about thirty inches long.

The distinguishing feature of the head of the Rhinoceros is the single nasal horn, which in the Indian species is usually about a foot in length, though there is a specimen in the British Natural History Museum that is nineteen inches long. Like all the Asiatic species, it possesses incisor teeth, a single pair of broad ones in the upper jaw, with sometimes a smaller pair behind them. The normal number of cheek teeth is seven in each jaw; they have flat planes, which imply that the mode of mastication is a backwards and forwards motion.

The Indian Rhinoceros inhabits the swampy grass jungles, where grasses grow to a height of twenty and thirty feet. In these forests of grasses and reeds a file of a dozen elephants will walk and scarcely give a sign of their passage. The Rhinoceroses give still less evidence of their movements, since they largely use regular runs, like those of hares and rabbits in less luxuriant verdure.

The elephant is often called into service in hunting the Rhinoceros. On a single animal the hunter tracks his quarry to its lair, and from his vantage point on the elephant's back he is usually able to shoot with telling effect. Sometimes a string of elephants is used to beat the Rhinoceros out of the jungle into more open ground. There is said to be mutual antagonism between the elephant and the Rhinoceros, and certain it is that the larger

animal will generally retreat without hazarding an encounter.

The capture of a specimen for the Zoological Gardens exemplifies the fear in which the Rhinoceros is held by the elephant. The animal, one of the Hairy-eared variety (*Rhinoceros lasotis*) of Chittagong, was found stuck in a quicksand, and, after much trouble, was secured by ropes and tied to a tree. In order to remove her eight elephants were brought to the spot. As soon as they saw the Rhinoceros they betrayed great alarm, and when urged towards her they turned round and ran away. However, at last they were induced to approach, and succeeded in bringing her safely to the stockade which had been prepared for her.

The unrooted horn of the Rhinoceros does not at first sight appear to be a very formidable weapon ; but from its position, together with the lower stature of the Rhinoceros, it gives advantages in striking the under parts of its larger antagonist.

Several Europeans mounted on elephants came up with a party of seven Rhinoceroses, led by a large and powerful animal. When the leader charged the hunters, the elephants wheeled round and received the blow of the Rhinoceros's horn on the hindquarters, and so powerful was the concussion that in more than one instance the elephant and its rider were brought to the ground. In the case of a contest with smaller animals the Rhinoceros more often employs its sharply-pointed lower tusks.

Of other Asiatic species, there is the Sumatran Rhinoceros (*Rhinoceros sumatrensis*), which has at least two distinguishing features. Its body is covered with brown or black hair, and it possesses two horns, the hinder and smaller one being placed between the eyes. It is a smaller animal than the foregoing, usually rising only to four and a half feet at the shoulder, but nevertheless attaining a weight of two thousand pounds. The Sumatran Rhinoceros is likely to suffer extermination, chiefly on account of the Chinese demand for its horns, which are ground into powder, that is considered a sure remedy for certain diseases.

The Javan Rhinoceros (*Rhinoceros sondaicus*) is considerably more gentle, and is not infrequently tamed by the Malays. The female of this species is almost invariably hornless.

AFRICAN RHINOCEROS.

In the several African species the skin flaps are absent, the hide being practically naked and smooth. The commonest of them is the Black Rhinoceros (*Rhinoceros bicornis*); it is also called the Borele or Rhinaster. It is a double-horned animal, the front horn measuring from twenty-two to twenty-eight inches, while the back horn is usually about half that length. The grinding teeth are ridged, for mastication calls for a champing movement, because the general food consists of twigs rather than grass. The animal is widely distributed, ranging through East and South Africa, from Abyssinia to at least the borders of Cape Colony.

It is a fierce, quarrelsome, and active animal, with its powers of scent and hearing wonderfully acute. An experienced hunter asserted that he would rather face fifty wounded lions than one wounded Borele. On the other hand, it is often hunted by natives who would not care to engage in the chase of the lion. An enraged Borele has been known to charge at a wagon, striking its horns through the planks, and next scattering the camp fire in all directions. This last is the more remarkable, in that wild beasts are generally afraid of fire.

The capability of the Rhinoceros for taking care of itself was once witnessed by C. J. Andersonn. He had wounded an animal severely, but had been unable to prevent it seeking cover where it was difficult to follow. Eventually the hunter came up with the Rhinoceros, only to find the partially disabled animal was being fiercely attacked by a couple of lions. They mauled and lacerated it severely, but in the end the Rhinoceros beat both of them off. For its gallant fight the hunter would have liked to spare its life, but it was wounded to the death, and a merciful ball put an end to its pain.

The Keitloa (*Rhinoceros keitloa*) possesses horns of nearly

the same length. It is a larger animal than the Borele, and is even more feared. The Mochuco, or Burchell's Rhinoceros (*Rhinoceros simus*), is the largest of the group. It stands six or seven feet high at the shoulder, and has an extreme length of sixteen to seventeen feet. Though it is only a slightly paler brown than other species, it is often called the White Rhinoceros. Fortunately, it is not a quarrelsome animal, for the front horn is sometimes three feet in length, and is a most terrible weapon. One abnormal specimen in the British Museum is fifty-six inches long, while Colonel W. Gordon Cumming possesses one that is 5 feet $2\frac{1}{2}$ inches in length. An English traveller was once nearly killed by a Mochuco. He had wounded the animal, which, instead of retreating, walked quietly towards its mounted enemy. The horse refused to stir, and when the Rhinoceros charged, its horn passed through the body of the horse, penetrated the saddle on the opposite side, and bruised the leg of the rider. The force of the impact was sufficient to toss the horse in the air, turning a complete somersault, and falling on its back. Another species, the Kabaoba (*Rhinoceros oswelli*), possesses a still longer horn. When firearms were muzzle-loaders, ramrods, four feet in length, were frequently cut from single horns.

Among the animals mentioned in the Scriptures, there is one introduced under the name of Reem, or Unicorn. Notwithstanding some difficulties that envelop the subject, it is thought that the Rhinoceros is the animal intended. The flesh of the Rhinoceros was held in considerable esteem by the earlier white settlers of South Africa. The Portuguese on the East Coast, on account of the amphibious habits of the animal, were permitted by their priests to view the animal as *fish*, and hence during Lent they partook of its flesh with an easy conscience.

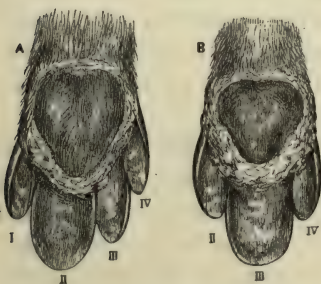
To the hunter, apart from the question of hides and tusks, there is an indescribable fascination in fetching down an animal perhaps a ton in weight. Between the years 1840 and 1880 the Black Rhinoceros was shot in thousands. Two men bagged no less than fifty upon one occasion in a single excursion; Oswell and a companion captured

eighty-nine in a season ; and in the same short period sixty fell to C. J. Anderson's gun alone. The White Rhinoceros is on the verge of extinction in South Africa, but here and there a few are very strictly preserved. Only a few years ago a native chief was heavily fined for permitting one to be killed in a preserved area. In Central Africa, however, there is little fear that the Rhinoceros will disappear for many long years to come.

FAMILY TAPIRIDÆ (TAPIRS).

The small group of animals which are called Tapirs look as if they had wandered into this world from among the extinct animals of antediluvian times. Their peculiar contour cannot be mistaken. The smooth-skinned hog-like body, with a pointed, conical head, produced into a short, flexible proboscis, seems to suggest that they form a link with the elephant. They are semi-aquatic animals, living in the neighbourhood of large rivers. They spend

much time in the water, and are said to be able to walk along the bottom. They are mostly nocturnal in habit, coming out of their retreats at night to feed on leaves and fruits. The elongated snout is of particular service as a kind of hook in pulling down boughs or fruits. In disposition the animal is naturally shy, timid, and inoffensive, but when attacked it will fight desperately. The



FORE (A) AND HIND (B) FOOT
OF THE TAPIR.

American Tapirs are generally of a dark brown colour ; the Malayan species has the upper part of the body white from the withers to the tail, with the remainder of the body nearly black. It looks exactly as if some one had played a practical joke upon it with a whitewash brush. Strangely enough, the young Tapirs, until they are five or six months old, are marked with longitudinal, fawn-coloured stripes, and rows of yellowish spots on the back and sides.



1. AMERICAN TAPIR.

2. INDIAN ELEPHANT.

(See page 253)

(Photos W. S. Berridge, F.Z.S.)



1. FOALS. 2. CART HORSE.

(See page 274)

(Photo Pictorial Agency.)

AMERICAN TAPIR (*Tapirus americanus*).

Plate XXVI. Fig. 1.

This is the commonest and best known of the five South American species. It is found chiefly in the forests of Brazil and neighbouring countries. It is a powerful animal, five feet in length, with a massive body and a thick, muscular neck, which is surmounted by a stiff mane. It leads for the most part a solitary life, amid the gloom of the forest, through which it makes its way, by more or less beaten tracks, to its usual resorts for food and water. Inoffensive and gentle, the Tapir, from its enormous strength and the toughness of its hide, does not fall an easy prey even to the poisoned arrows of the native hunter. By means of the earlier firearms it was impossible to make much impression on its stout covering. When attacked, the first thing the animal does is to rush to the river, clearing a path through the dense undergrowth by sheer weight and strength. If followed to the water it plunges in, where it seizes the attacking dogs and inflicts the most dangerous wounds. The jaguar is its chief natural enemy. On land the fierce carnivore finds it difficult to make an impression on the tough hide, and if the Tapir can only contrive to shake off its assailant and reach water, the jaguar not infrequently loses its prey. Tapirs in the neighbourhood of cultivated land work immense damage to sugar-canes and melons, and the cacao-planter in particular often bewails the destruction of his young plantations. In captivity the Tapir will modify its vegetarian diet, becoming practically as omnivorous as the common swine.

MALAYAN TAPIR (*Tapirus indicus*).

Coloured Plate XVII. Fig. 4.

The Asiatic Tapir is restricted to a solitary species that is found in the Malay Peninsula, Sumatra, and Borneo. It is the largest of the group, attaining a height of three and a half feet, and a length of eight feet from the tip of the snout

to the scarcely perceptible tail. Like its American congeners, the animal is of an exceedingly retiring disposition, but it can easily be domesticated, and a tame Tapir is an ordinary sight in a native village. A young one, when captured, can easily be led by the hunter, who bores a hole in the side of the snout, through which he passes a cord.

The flesh of the Tapir is coarse and dry to Europeans, but the South American Indians consider it almost as savoury as beef. The nape of the neck and the feet, cooked to a jelly, are morsels which Lucullus himself might have welcomed. Much the same thing used to be said of the foot of the elephant, whereas in reality European hunters fail to view it as a special delicacy.

FAMILY EQUIDÆ (HORSES).

In this family are the Horses, Asses, and Zebras, the solid-ungulated animals which have the bones of their toes enclosed in a solid, single hoof. Two species have been domesticated for so long that it is somewhat difficult to trace their natural origin. In another classification the family belongs to the order Pachydermata, or thick-skinned animals, in which were included the elephant, hippopotamus, swine, rhinoceros, tapir, and hyrax. The hair on the body is short and smooth, with the mane and tail usually long and bushy. There are six incisors in each jaw; the molars are six on each side, above and below; and there are two canines in the upper and the same number in the lower jaw. Many characteristics of the family are too well known to call for lengthy description, while the most important points will arise in the consideration of each particular species.

HORSE (*Equus caballus*).

Coloured Plate XVI. Fig. 2, Plate XXVII.

True Horses are represented by one common and well-established species, from which all other varieties are



1. Wild Ass

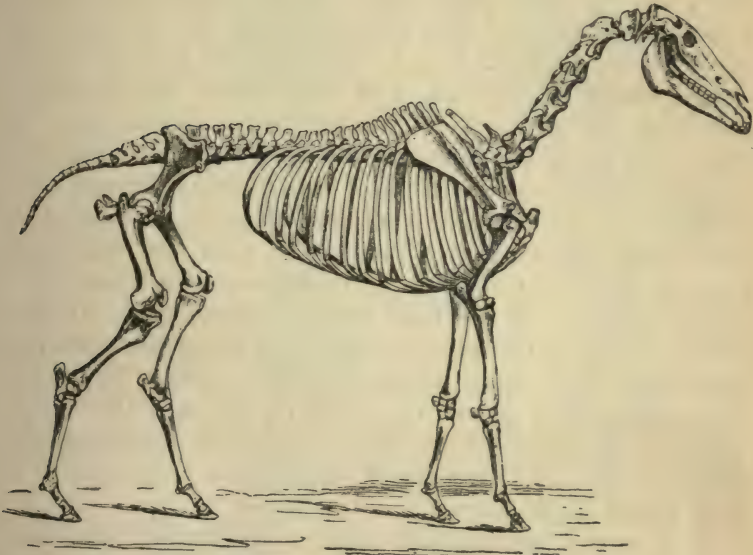


2. Horse

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descended. There are various breeds, each with its own purely artificial distinctions, such as differences in size and colour, and even in shape, but nevertheless possessing every point that marks the true Horse.

If the reader compare the skeleton of the Horse with that of the elephant or any other animal described in this chapter, he will find that it tells its own story. The expansive chest marks the possession of lungs of great size, and, therefore, it is intended for endurance. Speed is denoted in the length of limb and the bold projections for



SKELETON OF THE HORSE.

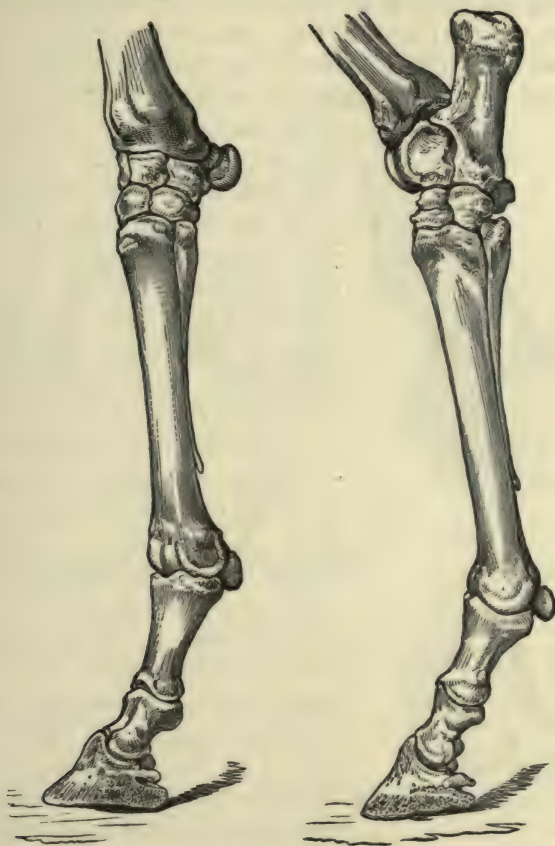
muscles upon the hind legs ; while the series of curves into which the whole structure can be resolved shows the design of the Creator to make it elastic from the head to the toes. Look along the spine, for example, and you will see that the vertebral processes are directed backwards from the shoulder nearly to the centre of the back. Beginning from the hip-bone the processes are directed forwards, while those in the centre of the back are upright. This is the spot where the rider is best seated to preserve to the fullest extent the elasticity of the structure.

Looking at the legs of a Horse, the question arises what has become of all the toes. In the animals which divide the hoof there are apparently only two toes to each foot; but a very superficial examination shows us that two other toes are only partly developed, and are absolutely useless as a means of progression. But examine the foot of the Horse, and to all appearance there is but a single toe, until we strip off the skin as far as the knee of the fore limb and the hock of the hind leg.

The normal number of digits (*i.e.*, fingers and toes) is five; but we have seen how various bones are often extremely modified. The thumb of the fore feet, or the great toe of the hind feet, is invariably the first in which development is arrested, and the others are modified according to the needs of the possessor. What, then, is this single toe of the Horse? We must transport ourselves to the Eocene epoch to find the animal termed the *Eohippus*, *i.e.*, the Dawn of the Horse. It was little more than the size of a fox terrier, with four complete toes on the fore feet, and the rudiments of a thumb distinctly marked; on the hind feet were three toes. In the Miocene period the thumb disappears altogether and the digits are still more reduced, until in the Pliocene, the creature had greatly increased in size, and the digits, with the exception of the third and fourth (counting the thumb as the first), were fused together so as to look as if they were a single bone.

It is now comparatively easy to understand the construction of the foot of the Horse, as shown in the illustration. The left-hand figure represents the fore-foot, or, as it might be called, the hand. Beginning at the top, we see the end of the radius, and below it the carpal bones, *i.e.*, those of the wrist. One projects beyond the others, and this is the rudimentary thumb. Below the carpal bones is a stout and straight bone, called the cannon bone. It is not a single bone, but is composed of the third and fourth metacarpals, which are fused together. At the side of the cannon bone may be seen a slight, elongated bone, with another of the same dimensions on the opposite side. These are the second and fifth metacarpals (*i.e.*, the first and

little fingers), and are of no practical utility. They are called the splint bones. The next three joints, which constitute the pastern, are the phalanges, or finger-joints of the third and fourth fingers. So we see that the so-called knee



HAND AND FOOT OF THE HORSE.

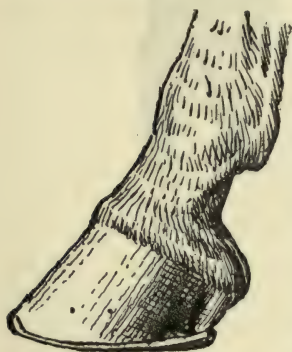
of the Horse is its wrist, and that the hand begins at the end of the radius.

Passing to the right-hand figure, which represents the hind foot of the Horse, we begin at the top with the end of the tibia, which corresponds with the radius of the fore limb. Next come the bones of the ankle, *i.e.*, the tarsal bones, the heel bone projecting very boldly, so as to give a

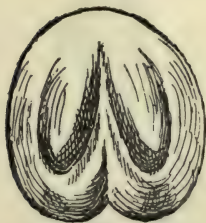
good leverage to the great ligament called the tendon of Achilles. Then come the metatarsals of the third and fourth toes fused together, those of the second and fifth being represented by the splint bones, and lastly come the digits, *i.e.*, the fingers or toes, which correspond so closely with those of the fore-foot that they are scarcely distinguishable from each other. It is a remarkable fact that foals are sometimes born with traces of as many as four toes, some

with one or other of the splint bones enlarged into a complete toe with a hoof at the end.

So the reader will perceive that the Horse walks upon the tips of the third and fourth fingers of the hand and the corresponding toes of the foot. The hoof is beautifully constructed, built up by no less than six hundred layers or scales of three different kinds of horn, resulting in wonderful elasticity to fulfil the tasks required of it.



FOOT OF THE HORSE
WITH SHOE.



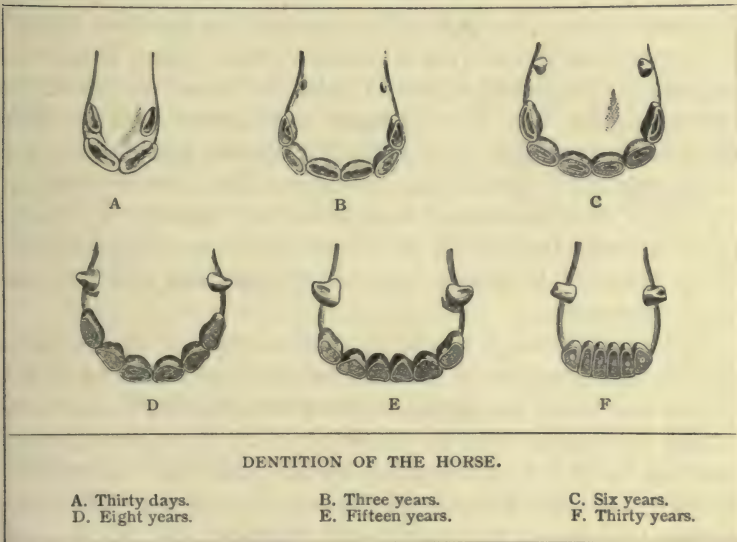
'FROG' OF THE HORSE'S HOOF.

without causing pain unless the quick be reached ; and thus it is an easy matter for a blacksmith to fit and fix a horse-shoe. The V-shaped formation on the under side of the hoof must never be cut away, for unless the 'frog,' as it is called, touches the ground, the hoof loses all its elastic qualities.

The teeth of the Horse will well repay inspection, if only because they have largely contributed to, if not actually decided, the fate of the animal as the servant of man. A full set of teeth numbers forty, viz., six incisors above and below ; four canines, one on each side above and below ;

and twenty-four molars, six on each side above and below. Sometimes there is an additional premolar in the upper jaw, but it is always small and is frequently wanting altogether. Between the canines and the molars is a vacant space called the 'bar,' in which fits the bit by which the Horse is guided and controlled.

A young horse or colt gets its second or permanent teeth in a fixed order. The two new middle incisors in each jaw appear when the animal is two and a half years old; the two next teeth a year later; and the two outside ones at the



end of another twelve months. Up to five years the age of the Horse can be fixed with almost perfect accuracy. After that period only experts can judge, being guided by the wearing of the ring of enamel round the edge of the crown of the tooth. But when this 'mark,' as it is technically termed, is worn down, the teeth afford no further definite indications of age.

It is doubtful if any real wild species is now in existence. True, there are still herds of so-called wild Horses in Africa and in Western and Central Asia; but there appears little reason to doubt that they are but the descendants of

domesticated animals, that have escaped and reverted to the wild state. Whether the Tarpan, or Wild Horse of Tartary, comes into this category or not, it is certainly the nearest approach to the original wild species. Its mouse-coloured coat is marked by a stripe on the back. In disposition it is wild and fiery in the extreme, and is only caught by the Tartar hunters lassoing it; or chasing it with trained falcons that flutter around the animal's head to distract its attention from the hunter.

The Horse is frequently mentioned in the Bible in a manner that denotes it was chiefly used in war, especially in drawing war-chariots. The animal was familiar to the Britons before the arrival of Julius Cæsar. King Ethelstan forbade the export of native Horses, the breed of which he improved by the introduction of German and Spanish varieties. As might be expected, a warlike people like the Normans paid particular attention to horse-breeding, especially such as would best serve for cavalry. To King John belongs the credit of introducing into England the heavy horse of Flanders for draught purposes and for field work generally.

The Arab Horse is probably a descendant of the original Asiatic wild species. It was introduced into Europe in the eighth and ninth centuries, together with the Barb, an allied breed in North Africa. Until warriors discarded heavy armour their horses required to be powerful rather than speedy, but the altered conditions of warfare called for horses possessing speed and endurance.

The result of centuries of careful breeding may be seen in the English race-horse, graceful and elegant, the swiftest horse the world has ever known. The record time for a mile is 1 minute 35½ seconds. The hunter is not a distinct breed, any really good horse well serving for cross-country work, if he possess the requisite qualifications, viz., muscular neck and chest, short body, and stouter legs than a racer. The maximum broad jump for a horse of this type is from thirty-three to thirty-seven feet.

Cart Horses require size, strength, and endurance, speed being altogether sacrificed to attain those ends. The English Shire Horse, the Clydesdale Horse, and the Suffolk

Punch, are excellent types of the animals which play no part in pomp and sport, but devote their ponderous strength to the world of commerce. Before the introduction of railways, pack-horses were largely used in the conveyance of merchandise to and from the English coast, and in many countries the Horse still serves in a similar capacity.

An average horse can carry comfortably on its back a load of only a hundred and twenty pounds, compared to one and a half tons it can draw in a wheeled vehicle. The best known breeds of Dray Horses can far exceed this weight. A well-built animal was put to a remarkable test on one of the Surrey railways. It commenced dragging twelve wagons of a total weight of thirty-six tons, to which were added other wagons, until the animal was moving fifty-five tons at the rate of nearly four miles an hour for six hours. Of course, the rails played an important part in the transport of the great weight, but that does not discount the enormous strength displayed by the Horse.

Of the endurance of the Horse, innumerable instances might be afforded where the animal is legitimately employed ; but its capabilities are best shown when driven to display its powers to serve the dire needs of its owner. A highwayman took flight from Chatham at four o'clock in the morning. At Gravesend he was delayed for nearly an hour, waiting for a boat to convey him across the Thames ; and this time the rider occupied in baiting his steed. At Chelmsford the horse was rested for half an hour, and then their course lay through Braintree, Westerfield, to Cambridge, and from thence to Huntingdon. Along the North Road the horse galloped, with occasional rests, until it was finally drawn up at York on the evening of the same day. In due course the rider stood his trial for robbery at Chatham, and would have swung upon the gibbet, but that the Lord Mayor of York testified that he spoke to the prisoner at 8.15 p.m. on the day of the robbery. The jury acquitted him on the ground that it was impossible for him to have travelled so great a distance in sixteen hours ; which showed that they did not know the Horse so well as did the man whose life the gallant steed had saved.

Of the smaller breeds of Horses, the Shetland Pony is

best known. Only seven or eight hands high (a hand equals four inches), they are as docile as they are hardy. Their coats are shaggy, and in winter become so matted as to protect the animals from the severe weather experienced in their northern home. Notwithstanding their small size, they are wonderfully strong, and they are capable of well sustained exertion without fatigue. A Shetland Pony once ran from Norwich to Yarmouth and back again, a total distance of forty-four miles, in three and three-quarter hours ; and though it was a feat that redounded but little to the credit of its owner, the result was a striking testimony to the powers of endurance of the little horse.

No account of the Horse would be complete without reference to the wild, or semi-wild, animals of America and Australia. In the latter case they are certainly not indigenous to the Southern continent, but are positively the descendants of horses imported by the colonists, which have escaped into the wilds to revert to a wild state. Small and ugly, the 'Brumbies,' as they are called, display the utmost vigilance in avoiding capture by man. In some districts at one time they existed in such numbers as to be a great nuisance to the settlers ; and in 1875, on one station alone in New South Wales, several thousands of the animals were shot.

In the case of the Wild Horses, or Mustangs, of Mexico and South America, there exist some elements of doubt concerning their origin. It is said that at the time of the discovery of America there were no Horses in any part of the Continent, and it has been suggested that the indigenous animals had been exterminated by the pumas. But whether they be indigenous, or the descendants of the Horses introduced by the Spaniards, the fact remains, that especially on the boundless pampas are enormous numbers of Horses, sometimes as many as several thousand in a single troop. They move about in parties, usually headed by a powerful stallion ; but when alarmed the whole herd moves in concert, and if attacked the strong will protect the weak. The jaguar is often beaten off from an animal that it has marked down. In fighting, the Horse rears itself on its hind feet and brings down its fore hoofs on the enemy, while at

less close quarters it kicks out its hind hoofs with terrific effect.

The Gauchos, or native peons, are expert Horse-catchers, and in rendering their captives submissive they are without equals in any part of the world, not even second to the Mexican *vaqueros*, or the ranchmen, called cowboys, of the United States and Canada. The Horses are sometimes chased and lassoed ; but more often they are driven into a corral, in much the same manner as elephants are captured.

‘ When the Gaucho wishes to take a Wild Horse, he mounts one that has been used to the sport and gallops over the plain. As soon as he comes near his victim, the lasso is thrown round the two hind legs, and as the Gaucho rides a little on one side, the jerk pulls the entangled Horse’s feet laterally, so as to throw him on his side without endangering his knees or his face. Before the Horse can recover the shock, the rider dismounts, and snatching his *poncho*, or cloak, from his shoulders, wraps it round the prostrate animal’s head. He then forces into his mouth one of the powerful bridles of the country, straps a saddle on his back, and bestriding him, removes the *poncho*. The astonished Horse springs on his legs, and endeavours by a thousand vain efforts to disencumber himself of his new master, who sits quite composedly on his back, and, by a discipline which never fails, reduces the Horse to such complete obedience that he is soon trained to lend his whole speed and strength to the capture of his companions.’

Primitive man not only hunted and tamed the Horse, but he made large use of its flesh for food. It was a well-known article of diet in Britain in the time of the Romans, as it was on the Continent generally, until, in the eighth century, its use was forbidden by edict in the Christian Church. But necessity knows no law. If the English had not besieged Copenhagen in 1807, it is doubtful whether the Danes would now largely utilise horseflesh, for it was when the citizens were reduced to extremities that they gained a liking for the meat. As late as 1629, a man was condemned to death in France for eating horseflesh during Lent ; but in modern times the meat is in considerable demand, largely because it is only about half the price of beef. Attempts have been

made to popularise the use of horseflesh in London, but there is practically no demand for it, except as food for dogs and cats. Apart from the services it renders to man during its life, the Horse on its death yields useful products in its hide and hair ; the former is converted into excellent leather ; the long hair is woven into hair cloth of great use in upholstery, while the short hair is used for a variety of purposes.

WILD ASS (*Equus tæniopus*).

Coloured Plate XVI. Fig. 1.

Although belonging to the same genus, it is easy to distinguish the Ass from the horse. It is a smaller animal, with a short, upright mane, very long ears, and the tail has long hair only at the end. The hoof is narrower and more pointed than that of the horse. Though the animal has been domesticated from the very earliest periods, there are still parts of the world where it is as wild and free as ever was the Dziggetai, or Wild Ass of the Scriptures, which in its fleetness 'snuffed up the wind like dragons.'

In Asia the Wild Ass (*Equus hemionus*), or Onager, ranges from Syria, through Persia, and over vast tracts in Central Asia. In Africa the animal occurs in the north-east of the continent, particularly in Abyssinia, Somaliland, and parts of the Sudan. It is the African species that is figured on the plate. The Asiatic species averages six or seven feet in length, with a height at the shoulders of about four feet. In colour it is generally silver-grey with the under parts white, a dark stripe running along the middle of the back, from the mane to the tail. There is, however, considerable variety in colour, for reddish-grey and chestnut animals are quite common.

Inhabiting more or less arid regions, the Wild Ass, in parties of from two to a dozen, roams over the desert plains or the mountain uplands, seeking grass and water at varying elevations according to the season. It is said that a herd of as many as a thousand animals has been encountered, probably consisting mainly of mares and foals.

The animal is remarkable for its wariness, fleetness, and its ability to keep up a great pace even over very broken ground. The Persian method of capturing the Koulan, as they call the Wild Ass, is to lie in wait for the animal at a drinking-pool, and then to chase it on specially fast horses. Out in the open plains the Ass can only be taken by means of relays of horses and fleet dogs of the greyhound type. Even when captured it is by no means certain that a Wild Ass can be broken in to render useful service, for frequently it remains absolutely vicious and intractable, in which respect it offers great contrast to the wild horse under similar conditions.

The African Wild Ass is typified in the variety which inhabits Egypt and Abyssinia. It is principally bluish-grey in colour, but the ears are longer, the mane shorter, and the tail less haired than in the Asiatic species. 'The animal in its native desert,' says Sir Samuel Baker, 'is the perfection of activity and courage; there is a high-bred tone in the deportment, a high-actioned step when it trots freely over the rocks and sand, with the speed of a horse. When it gallops freely over the boundless desert, no animal is more difficult to approach, and, although they are frequently captured by the Arabs, those taken are invariably the foals, which are ridden down by fast dromedaries, while the mothers escape.'

In the regions which it inhabits the flesh of the Wild Ass is held in considerable esteem, the Tartars and the Persians preferring it to almost any other meat. The skin is highly valued, and is made into the celebrated shagreen, which is dear not only on account of the scarcity of ass hides, but because of the slow and intricate method of preparation.

DOMESTIC ASS (*Equus asinus*).

Coloured Plate XVII. Fig. 2.

There appears to be little doubt that the domestic Ass is the African species in a tame state. The Valley of the Nile was the scene of its earliest domestication, from which

it rapidly spread to other Eastern countries. Its introduction into Europe may be considered comparatively recent; in England it was known in the time of King Ethelred, when it was valued at about twelve shillings, a considerable sum in those days; in later years it fell into disfavour, and was little used until the time of Queen Elizabeth. In our own rather unfriendly clime the Ass is ordinarily a spiritless and rather degraded animal, inured to harsh treatment, hard labour, and the scantiest of fare, in return for which it exhibits a stubbornness and obstinacy that are proverbial.

In Eastern countries, as Egypt and Syria, Persia, and even India, the Ass attains a considerably larger size than in Western countries. It is a far more valuable animal, well groomed, better fed, with a corresponding good return for the trouble and expenditure incurred. It is capable of a good day's journey at a moderate pace, with a man on its back, and it has a spirited demeanour and wide-awake manner which render it a pleasant quadruped to deal with. The breed is carefully selected, and a well-bred Ass will fetch as much as forty pounds. Amongst the Jews the most honourable persons rode on Asses, and it was used for all purposes of agriculture and also as a pack animal. Our Saviour made His triumphant entry into Jerusalem upon a colt, the foal of an Ass, and the animal selected was not typical of meekness, but honourable and suitable in dignity to bear the King of Israel.

In the Southern countries of Europe, Spain and Italy in particular, and in the Andes regions of South America, the Ass is an animal of considerable importance, its sure-footedness making it a useful pack animal, where roads are often practically non-existent, or at best poorly constructed. In these countries the animal attains a considerably larger size than in our own land; in the United States also, the Ass frequently attains a height of from fourteen to sixteen hands. These large male animals, mated with female horses, produce the crossbred animals that are known as mules; if the sexes are reversed the offspring is called a 'hinny.' Mules are remarkably surefooted, and possess special powers of endurance that make them invaluable for

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Plate XVII.



1. Quagga



2. Domestic Ass



3. Zebra



4. Tapir

carrying burdens, in rocky regions where a horse would be practically useless.

ZEBRA (*Equus Zebra*).

Coloured Plate XVII. Fig. 3.

The true Zebra was at one time found in large numbers in the mountainous regions of Cape Colony, for which reason it was called the Mountain Zebra. In modern times it has been almost exterminated, and there remain only a few, that are strictly preserved in some of the more remote districts. It is a singularly handsome animal, four to four and a half feet high at the withers. Upon a groundwork of white is a series of glossy jet-black stripes, extending from its nostrils to its hoofs, excepting only the white under parts. The muzzle is brown; the tail is scantily haired, except at the tip. The animal is exceedingly difficult to approach, not only on account of its watchfulness and agility, but equally so because of the difficult country which it inhabits. While feeding on the hillsides, sentinels are posted, and the moment there is any cause for alarm the animals are off like the wind.

Burchell's Zebra (*Equus burchelli*) is a native of the plains to the north of the Kalihari desert and in the Zambesi regions. It is a little taller than the last named, and in colour it is more yellowish-brown; the greater part of the legs is white, without the dark stripes, or at best only faint ones. It is strong and muscular, and its bony limbs suggest that it would make an excellent beast of burden. It has been used by the Dutch colonists in harness with mules, but not very successfully; the Mountain Zebra was practically fairly tractable in harness, but always returned to its stall with such ungovernable fury as to endanger the lives of those whose duty it was to stable it. On the other hand the Hon. Walter Rothschild had a team of four Zebras at Tring Park that were extremely docile.

In Burchell's Zebra the senses of sight, hearing, and smell are particularly acute. Any object with which they are unfamiliar, or the slightest taint in the air, immediately

attracts their startled attention. 'They combine in a compact body when menaced by an attack either from man or beast; with their heads together in a close circular band they present their heels to the enemy, and deal out kicks in equal force and abundance. Beset on all sides, or partially crippled, they rear on their hinder legs, fly at the adversary with jaws distended, and use both teeth and heels with the greatest freedom.'

Grevy's Zebra (*Equus grevyi*) is found still further north in the Victoria Nyanza regions. It combines the chief features of the two foregoing species. Its stripes are narrower than those of the common Zebra; its long mane and well-haired tail more nearly resemble Burchell's Zebra. Though Grevy's Zebra will at times mix with domesticated animals, unlike the other species it has not been known to interbreed with either the horse or the ass.

QUAGGA (*Equus quagga*).

Coloured Plate XVII. Fig. 1.

The Quagga, slightly smaller than the zebra, was formerly found in immense herds in the South African plains south of the Vaal River, though it never associated with the zebra. It not infrequently consorted with gnus and ostriches; and upon occasion it would join the domesticated ass in the neighbourhood of settlements. Zebras have been known to act similarly, and upon one occasion a zebra stallion was fiercely attacked by a male donkey, which held its wild relative until a settler was able to effect its capture. Though fierce in its native plains, and often proving a match for the hyæna, the Quagga was amenable to man when in captivity. Quite early in the nineteenth century a gentleman drove a couple in harness in Hyde Park. In all probability the animal is now quite extinct, largely owing to the Kaffirs and Bushmen hunting it for food; and always the lion was very partial to zebra and Quagga flesh.

Chapter X

ORDER VI.—UNGULATA (*continued*)

**SUB-ORDER 4.—ARTIODACTYLA (EVEN-
TOED ANIMALS)**

GROUP I.—RUMINANTIA

Sub-order 4. Artiodactyla—Group 1. Ruminantia—General description of the Pecora or true Ruminants—Hollow-horned Ruminants: Family Bovidæ: Domestic Ox—Zebu—Wild Oxen — Gaur — Gayal — Banting — Yak — European Bison — American Bison — Indian Buffalo — Cape Buffalo — Anoa — Musk Ox — Sheep and Goats—Domestic Sheep—Mouflon — Argali—Pamir Wild Sheep—Barbary Wild Sheep — Bighorn — Common Goat — Angora Goat—Kashmir Goat—Ibex—Markhor—Tahr — Various Wild Goats—Family Antilopidæ: General description — Chamois — Gazelle — Springbok — Gemsbok — Oryx — Equine Antelope — Sable Antelope—Waterbuck—Eland—Gnu—Nilgai—Prong-horned Antelope—Saiga Antelope — Klipspringer — Kudu — Hartebeest — Blesbok—Addax—Royal Antelope—Dik-Dik Antelope—Family Camelopardalidæ: Giraffe—Okapi — Solid-horned Ruminants: Family Cervidæ: General description—Red Deer—Fallow Deer—Roe Deer — Elk — Reindeer — Wapiti—Virginian Deer—Mule Deer—Pampas Deer — Browsers — Pudu Deer — Axis Deer — Sambar—Schomburgk's Deer—Eld's Deer—Muntjac — Japanese Water Deer — Chinese Water Deer—Elaphure—Musk Deer.

CHAPTER X

Order VI.—Ungulata (*continued*)

Sub-Order 4.—ARTIODACTYLA (EVEN-TOED ANIMALS)

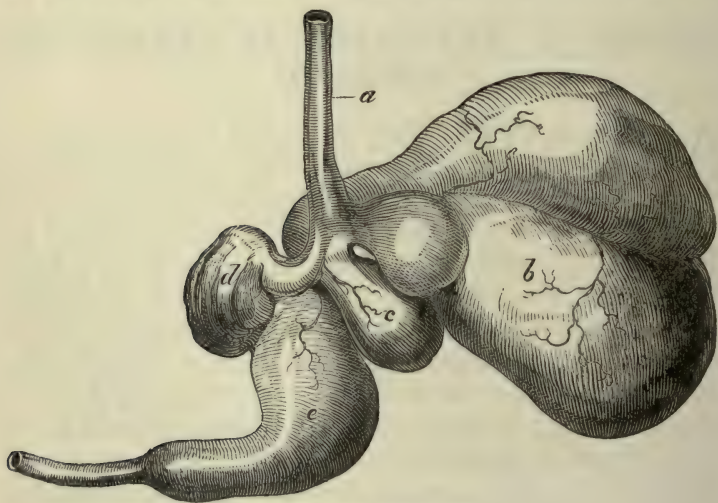
ARTIODACTYLA means even-toed, and in this sub-order are only those animals which possess an even number of digits, either two or four, on all the feet. It includes by far the greater number of the species of the Ungulata, *e.g.*, cattle, sheep, goats, antelopes, deer, giraffes, camels, pigs, &c. Many of them are ruminating animals, and, with the exception of the omnivorous swine, all of them are purely vegetable feeders. In most of the species the upper jaw lacks incisors, and very frequently there are no canine teeth ; but many of them are furnished with horns, and a few of them with tusks. It is of importance to note that practically all the animals whose flesh supplies the tables of all the civilised, and many of the uncivilised, peoples of the world, are included in the sub-order Artiodactyla, which is again divided into four well-marked groups.

GROUP I.—RUMINANTIA.

The Latin word *rumen* signifies the paunch of an animal, and the title, Ruminantia, is given to those animals which chew the cud or ruminate, *i.e.*, first gather their food into a receptacle called the paunch, and then return it to the mouth to be masticated while the animal is at rest. In most mammals the stomach is of very simple construction, merely a bag, the inlet of which is the œsophagus or gullet, the

outlet at the other end being the pylorus, *i.e.*, the 'little gate,' which opens into the small intestine.

But for rumination the stomach is a much more complicated structure, large in proportion to the size of the animal, and divided into four distinct compartments. In the accompanying figures is first presented the external appearance of a Ruminant's stomach, and then is shown the same organ in section. Most Ruminants have a hard and almost horny pad in place of incisor teeth in the upper jaw, and the food is only torn, rather than bitten, before it passes through the gullet, marked *a*, into



STOMACH OF A RUMINANT.

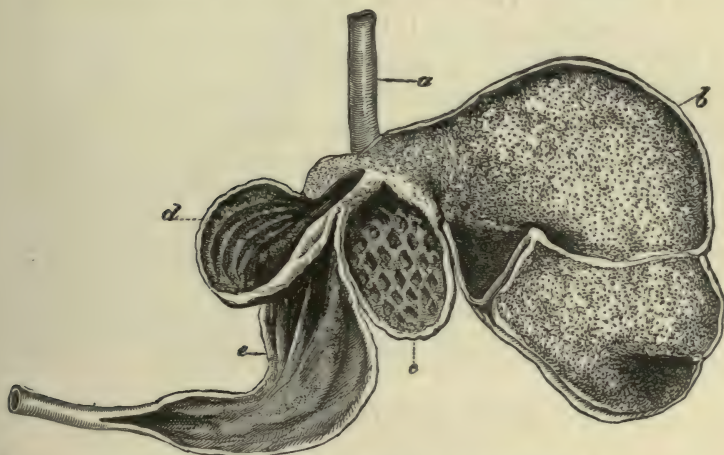
the paunch, which is the large division of the stomach, marked *b*.

When the animal, a cow for example, has filled the paunch, or *rumen*, it lies down and proceeds to chew the cud, each process of which is distinctly easy to follow. A portion of the food enters the second division, marked *c*, which is called the reticulum, or little net, because it is lined with small cells like network, which the butcher calls the honeycomb. In these cells the food assumes the form of little pellets, which are then ejected and thrown into the mouth to undergo proper mastication, the animal chewing

with its back or grinding teeth, moving the lower jaw from right to left.

When swallowed for a second time the food passes into the third division, marked *d*. This receptacle is called the omasus or psalterium. The first name is from a Greek word signifying 'all together,' because the balls which are chewed as the cud are thrown together into it; the second name literally means a psalter, in consideration of the lining of the receptacle resembling the leaves of a book. The butcher calls it the 'moniplies' or many-folds.

The food then passes into the stomach proper, marked *e*,



SECTION OF THE STOMACH OF A RUMINANT.

and which is commonly called the reed or red, from its colour; the scientific name is abomasus. Here the gastric juice is secreted and the process of digestion takes place. The gastric juice of the calf is the useful material called rennet, with which milk is curdled before converting it into cheese.

The technical name of the true Ruminants is *Pecora*, and besides the oxen, sheep, and goats, includes antelopes, deer, and giraffes, which chew the cud in precisely the same manner; in the case of the camel, llama, and chevrotains, there are divergences, that will be best considered when the particular animals are described.

The Ruminant chews the cud and also it 'divides the hoof.' The cow has typical cloven feet, in which the thumb of the fore and the great toe of the hind feet are entirely wanting. The foot consists really of the third and fourth toes, upon which it walks, while the second and fifth are less developed, and though hoofed are little less than mere spurs. In the camels and giraffes even these last are lacking.

Many, if not most, of the Ruminants possess horns on the head, which may be either one of two distinct kinds. Those of the deer tribe are not true horns, but antlers, composed of the same material as bone; they are not permanent, but are shed annually. The horn of the cow is made of the same material as the hoof, and is like baleen, or whalebone, which is nothing less than an agglomeration of hairs (see p. 405). It is formed round a projection of the skull, called the core, and consequently is hollow at the base, and practically throughout its entire length. Generally the horns are permanent, there being but few exceptions. The Hollow-horned Ruminants are of the utmost importance to man, and may well take the first place in a description of the various species of the Artiodactyla.

HOLLOW-HORNED RUMINANTS.

FAMILY BOVIDÆ (OXEN, &c.)

Included in the Oxen are not only the massively built animals with which we are acquainted in our own country, but also the Bison, Buffalo, and Yak. A child, when asked to define an Ox, said it was a square animal with a leg at each corner, in which was naïvely expressed the childish conception of the solidity which marks the Oxen family. The head, short in proportion to the body, and attached to a short, thick neck, is nearly in a line with the back. The muzzle is broad and naked; the tail is long, thinly haired for the most part, but with a tuft at the end. Most of the males show a large dewlap, extending from the chin to well between the fore legs.

Both sexes possess horns, and there is usually little difference in their dimensions. The horns may be cylindrical



1. Merino Sheep



2. Domestic Swine



3. Sheep



4. Domestic Goat.



5. Cow and Calf

20 21 22 23 24
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

or angulated, but they are never spirally twisted, or marked by knots or excrescences of any kind. Domesticated animals are cosmopolitan; they are spread throughout the entire globe, excepting only the extremely cold regions. In a wild state Oxen are gregarious, roaming grassy plains or dense forests, and in one or two cases even cold mountainous regions.

DOMESTIC OX (*Bos taurus*).

Coloured Plate XVIII. Fig. 5.

The ancient wild Ox of Europe was the Urus, or Aurochs. Julius Cæsar has left it on record that the animal was little less than an elephant in size, and that a man's prowess was gauged by the number of horns he had secured in the chase. The domesticated cattle of Europe are doubtless the descendants of this wild species, although it is quite probable there were others.

The domestication of the animal, the growth of population, and the ever increasing toll of man in search of the best of meat would naturally cause a diminution in the numbers of the wild species; and upon this in 1348 came the Black Death, in which animals suffered terribly, though in a less degree than human beings.

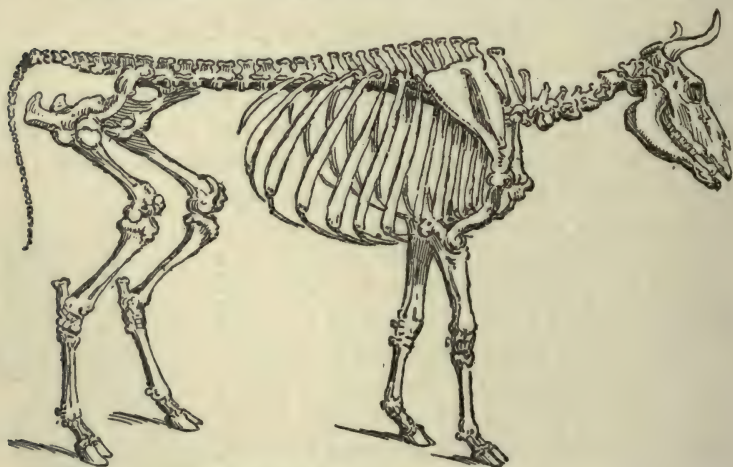
In various parks in England and Scotland are still herds of wild or semi-wild cattle (Plate XXVIII. Fig. 2), that are often claimed to be the direct descendants of the Aurochs; but it is far more likely that their immediate ancestors were some of the earlier domesticated breeds. One of the best known herds is that in Chillingham Park, Northumberland, which certainly dates back for nearly three centuries. The animals present features that are distinctly interesting; they graze chiefly at night; they hide their young; and, though shy and moving off while some approaching object is at a considerable distance, they exhibit much fierceness when pressed.



FOOT OF THE COW.

In many regions there are numerous domestic breeds of Oxen, differing considerably in shape and colour, and varying in the quality of their flesh, and in the quantity and richness of the milk they yield. The flat backs and rather rectangular bodies of the domesticated Ox always distinguish it from the majority of the truly wild species. British breeds, of which there are many varieties, rank high among the world's domesticated cattle, and they are eagerly sought for by foreign and colonial buyers to improve their own strains.

Various breeds of long-horned cattle have largely given



SKELETON OF THE COW.

way to the famous Shorthorns of the northern counties. This is undoubtedly the best all-round breed—large, level-backed animals, easily fattened for market. Apart from meat and milk, short-horned animals are easier to handle in the field and especially in transport, whether by boat or rail. Herefords are chiefly red, with white faces and rather long, upturned horns. They are excellent animals for fattening, and are in great demand for summer beef. The Sussex and the Devons are popular breeds; the former in particular was once very largely employed in draught and farm work.

Highland cattle are moderate or small-sized animals, with

thick hides and shaggy black or brown coats. They are grazed largely in the Western Highlands and fattened in the South. They yield beef of the finest quality. Welsh cattle are as hardy as the Highland, thriving on poor mountain pastures; they are mostly black, and the horns are rather long. There are also polled or hornless cattle, of which the Red Suffolk is one of the best examples; it is a valuable breed, hardy and a wonderful milker. The Alderneys and Jerseys are small animals of practically little use to the butcher, but they yield the richest yellow cream and butter. So much is this the case that the milk of even one cow will make an appreciable difference to the milk of a whole herd of another variety.

Of the Continental cattle may be mentioned the Dutch black and white breed, which is also popular in Denmark and in a large part of Germany. The animal requires no testimony beyond the statement that Holland and Denmark are among the finest dairying countries in the world.

In all civilised countries cattle-breeding is an important branch of agriculture, but many of the great industrial populations look to the vast grazing grounds of the New World and Australasia for a large proportion of their meat. In the British Isles, with a population of about forty-five millions, we possess about eleven million cattle; the United States has only double the population but five times as many cattle; Argentina has only a population of five millions, yet owns twenty-one million cattle; and Australia and New Zealand, with a population far less than that of London, possess more cattle than are in the whole of the United Kingdom. Every year it is necessary to import into the British Isles about a million tons of meat, and it is easy to see that the three regions mentioned above will at any rate be able to supply much of the beef that is required.

ZEBU (*Bos indicus*).

Coloured Plate XIX. Fig. 3.

The Indian Ox, Zebu, or Brahmin Bull, bulks largely in the fifty million cattle of India, and it is common in East

Africa and Madagascar. Its distinguishing characteristics are a large hump upon its withers, drooping ears, and a very large dewlap. Its coat is generally exquisitely fine, the colour being cream or grey, white or mouse colour. It seldom seeks the shade, and is never seen standing knee-deep in water, as British cattle are so fond of doing in the warm weather. There is a variety of breeds, with marked diversity in size, ranging from those equal to our own larger breeds to others scarcely bigger than a mastiff.

The Zebu is gentle in disposition, and is used for riding and for draught; but in India many of the finer bulls are dedicated to the god Siva. These sacred bulls are nearly as intolerable a nuisance as the venerated monkeys referred to in an earlier chapter. They wander just where they like in the streets and market-places, block up the traffic, and no one dares to drive them away. They help themselves to the choicest vegetables and fruit, and the aggrieved owners may not even check their depredations. They behave generally like spoiled children or dogs, rendered selfish and offensive by the weakness of those who ought to have taught them better.

In the early days of the railway in India a Brahmin bull charged a locomotive, with somewhat disastrous results to the holy animal. It was feared that the natives would view the railway as a menace to their religion. To the great satisfaction of the authorities the people did not take offence; they simply accepted the engine as a superior divinity, and decorated it with flowers.

WILD OXEN.

In many parts of the world, but especially in India, Australia, and South America, are vast numbers of wild cattle, that are but the descendants of domesticated species. They are probably as wild and unrestrained as ever was the Aurochs itself, and in the immense plains where they roam it is difficult to come within gunshot of them. These feral animals call for no mention beyond the fact of their existence, but there are various genuine wild species, without which no account of the Ox tribe would be complete.

GAUR (*Bos gaurus*).

The range of the Gaur is wide, including most of the hilly, forested regions between the North-eastern Himalaya and Cape Comorin ; from Assam the animal extends to the Malay Peninsula.

The Gaur is one of the most magnificent specimens of the Ox tribe ; so large is it that its native name signifies 'horned elephant.' A full-grown male stands six feet high at the shoulder ; its hide alone is a fair load for a draught ox. The greenish-yellow horns are flattened, especially where they spring from the skull ; they average two feet in length, but are very often quite three. Its well set-up, massive forequarters give the animal a particularly bold and alert appearance, largely due to a ridge running from the shoulders to the middle of the back. There is practically no dewlap. The colour of the hide is mainly dark brown, merging into black with age ; the legs are chiefly white. The thick hide that covers the shoulders is largely used for native shields.

Living in herds of seldom more than a dozen animals, the Gaur is shy and timid, and never visits the vicinity of settlements or cultivated land. Considering its size the animal is remarkably active, especially in the hilly and wooded ground which it frequents. Fierce combats take place between the bulls for the leadership of a herd ; but even an old, solitary bull is really seldom dangerous to the hunter, except from its first blind rush when surprised in its jungle lair.

The Gaur has been domesticated to a very small extent, and only by the hill tribes of the North-east.

GAYAL (*Bos frontalis*).

Plate XXIX. Fig. 2.

The Gayal, or Mithan, is found chiefly in the region east of the Bramaputra, but also in the coast strip extending as far as Tenasserim. It is a smaller animal than the Gaur ; the shoulder-ridge is less defined, but the dewlap is bigger.

The horns are conical instead of flat, and though they curve upwards they do not bend inwards at their tips. The Gayal is very easily domesticated, and in its native regions many of the herds, though half-wild, return to their owners at night after roaming the forest all the day. Unlike the zebu, the Mithan is never used as a beast of burden or in agricultural labour.

The Kukis of the Chittagong region, in capturing the animal, trade upon its liking for salt and a particular kind of earth. Balls of these mixed substances are thrown down in some jungle area that is known to be frequented by a wild herd. The animals will not leave the district so long as there are balls to be consumed, and the hunter spreads them about for a period of five or six weeks. During this time he sends out his tame Gayals to mix with their wild brethren, and then proceeds to familiarise the wild oxen with himself. Presently he can go among the mixed animals and stroke the tame ones without affrighting the wild ones, who in due course allow themselves to be caressed. Thus it comes about that at the end of the fifth or sixth week the Kuki villager is able to drive home the mixed herd, there to complete the subjection of the latest additions to his stock.

The Banting, or Javan Ox (*Bos sondaicus*), more nearly approaches the typical domestic oxen than either the gaur or gayal. Its range extends throughout Burma, the Malay Peninsula, and some of the larger islands beyond; in Indo-China it is by no means uncommon. It is a dweller of the plains rather than the uplands. Lending itself very well to domestication, the Malays keep large herds of Bantings. The domesticated animal mixes freely and breeds with the ordinary humped cattle of India.

YAK (*Bos grunniens*).

Coloured Plate XIX. Fig. 2.

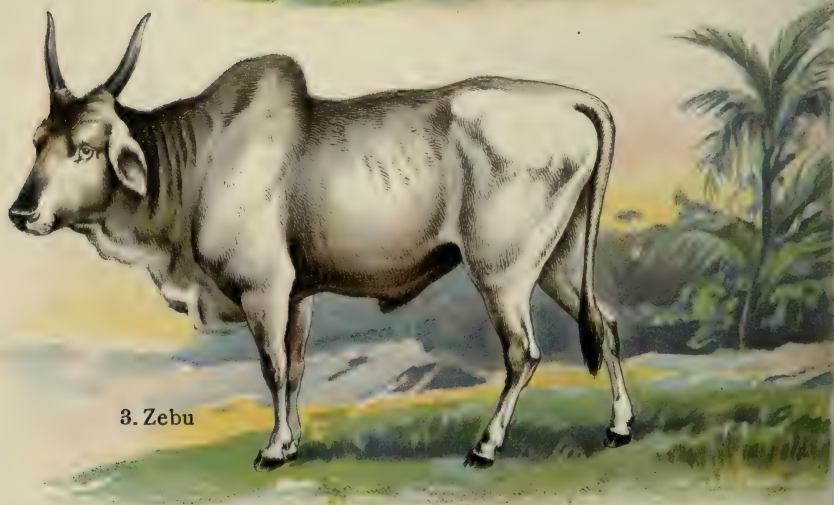
The Yak, or Grunting Ox, appears to be a connecting link between the true Oxen and the Bisons. It is practically restricted to Tibet and the adjacent mountains and



1. European Bison



2. Yak



3. Zebu

tablelands. From the bison-like head of the animal spring two horns, often each a yard long and with a girth of eighteen inches at the base. It is a short-legged, massive, shaggily-clothed animal, the black, silky hair being longest on its shoulders, flanks, and thighs, ending in a bushy white tail like that of a horse. In India the Yak's tail is called a 'chowry,' and as a fly-switch it invariably figures largely in the great ceremonial processions of the East.

The wild Yak wanders about the desolate mountain regions in herds of from ten to a hundred. It delights in cold, and will thrive on the rough, wiry pasturage which is obtainable at even an elevation of 20,000 feet. The Tibetans are extremely jealous of the few foreign sportsmen who enter their sterile country, and forbid the hunting of the Yak under severe penalties. The French travellers, Huc and Gabet, once encountered a herd of wild animals that had been frozen in the ice while crossing a river. Only the heads of the poor dead beasts appeared above the glassy surface. If this animal tragedy had been followed by a landslide, the preserved bodies of the Yaks might have been dug up ages afterwards, just as in the case of the mammoth remains in the north of the continent.

The domesticated Yak is an animal of the greatest economic importance in the Himalayan regions. It is the only beast of burden that can traverse those high altitudes, and it forms really the sole means of communication between India and Tibet. In a temperature where quicksilver freezes, along mountain tracks covered deep in snow, the loaded Yaks, surefooted as goats, scramble along uncomplainingly where camels and horses would lie down and die. Even when one of the beasts slips from the treacherous path and rolls down the mountain-side it will recover itself and clamber back to its companions. One great disadvantage is that the Yak will not eat grain. For the use of the pack-animals a large amount of fodder must be carried, or a party has to go ahead to collect the mountain pasturage that is perhaps far removed from the sterile, rocky passes which form the only available roads.

The Yak is sometimes crossed with ordinary cattle, and the half-breeds are able to endure the heat of some of the

mountain valleys, which the pure Yak would find to be quite intolerable. This, however, applies not to Tibet so much as the North-western Himalaya—for example, the route between Leh and Kashmir.

Opinions differ concerning the flesh of an old Yak, but by common consent the meat of a young animal is richer than ordinary veal. The milk is often dried and powdered; the hair is spun into a variety of fabrics; and in the most desolate regions Yak dung and bones are the only available fuel.

BISONS.

The Bisons form a very distinct group of the Oxen family. Their distinguishing features are their massive fronts, the withers being much higher than the hind-quarters, the general effect being heightened by the thicker covering of hair on the head, shoulders, and fore legs.

EUROPEAN BISON (*Bos europæus*).

Coloured Plate XIX. Fig. 1.

The European Bison is very often improperly called the Aurochs. It resembles a brown, heavily-fronted, stout-limbed Ox. It is usually fierce and dangerous, and as the animal is ten feet in length, it is an opponent not to be lightly encountered. It generally feeds in the morning and evening, chiefly eating leaves, twigs, and bark. The cows calve only once in about three years. It is said that a bull Bison will maintain its own against at least four hungry wolves.

The Bison was once common on the Continent. Fossil remains are found in England, and indicate that the animal was once much larger than the few of the species that are now in existence. There are only a few wild specimens in the Caucasus, and a fair-sized herd is specially preserved in Lithuania. In this region, in 1752, the King of Poland in a great hunt killed as many as sixty in a day. When the animals were threatened with extinction, steps were taken

to preserve the species, with very good effect. But when there was a revolution in the country numbers of refugees fled to the forests, and they did not scruple to hunt the preserved animals for food. Thirty years ago it was calculated that not more than six hundred Bisons survived, and they have gradually decreased, and the time is not far distant when the European Bison will be added to the list of extinct animals.

AMERICAN BISON (*Bos americanus*).

Plate XXVIII. Fig. 1.

The American Bison, more often than not incorrectly called the Buffalo, is a bulkier animal than the European species, from which it differs chiefly in the possession of a still larger head and a clothing of longer and shaggier hair. A bull will often measure 5 feet 8 inches at the withers, but though the average is below this, the species will weigh anything from fifteen hundred to nearly two thousand pounds.

Owing to its shagginess the Bison appears to be of greater size than in reality is the case; but 'the magnificent dark-brown frontlet and beard, the shaggy coat of hair upon the neck, hump, and shoulders, terminating at the knees in a thick mass of luxuriant black locks, to say nothing of the dense coat of finer fur on the body and hindquarters, give to the species not only an apparent height equal to that of the Gaur, but a grandeur and nobility of presence which are beyond all comparison among ruminants.' These are the words of Mr. Hornaday, than whom no one is better qualified to speak of the animal.

A melancholy interest is attached to this member of the Ox family, which formerly ranged over the prairies of North America from the Arctic Circle to Mexico. Well within the memory of living man the Bison blackened the prairies with its countless herds. It was to the red man what the walrus still is to the Eskimo. The flesh afforded abundant food for himself and his wife and children; its skins furnished him with coverings for his wigwams, or tent-houses;

supplied him with warm robes wherewith to defy the frosts of winter ; and gave him the flexible, yet almost impenetrable, shields with which he could ward off the arrows, spears, and even the bullets of his enemies. It is true that the red man, being only a few steps beyond the absolute savage, had no idea of preserving a creature so invaluable to himself, and that he destroyed it wherever he could find it. He organised hunting parties and killed thousands of Bisons annually merely for their skins or for the most delicate parts of the meat, leaving the rest to the beasts and the birds.

The destruction of a large number of Bisons at the same time was always facilitated by their strange lack of perception of danger. Once a herd stampeded, nothing could turn aside the compact mass of plunging beasts, galloping with the head close to the ground and the tail high up in the air—not even a yawning precipice or a bog that was a trap for pounding feet. The fate of the leaders was no warning to those in the rear. The Indians, by means of a cordon, often drove a whole herd to destruction, not using one-tenth part of the dead, but leaving the carcasses to decay. The herds always moved southwards from two to four hundred miles as winter approached, and during these migrations their numbers would be sadly depleted by quicksands, bogs, river-fords, or treacherous ice.

No quadrupeds of any size ever congregated in such immense numbers as the American Bison. To find a parallel one must go to the Rodents ; but a swarm of lemmings or hamsters is a very different matter to a multitude of ponderous animals such as the Bison. It was no mere figure of speech to say that the prairies were blackened with Bisons. Only as far back as the early seventies a train on the Kansas Pacific Railway passed through a herd for a distance of over a hundred miles. It was the construction of the transcontinental railways that finally spelt almost total extinction of the Bison. The white man ought to have checked the Indian and imposed limits upon the destruction of so important an animal ; but he outrivalled the savage in the work of extermination. In 1872-74 no less than four millions and



1. AMERICAN BISON.

2. ENGLISH WILD BULL.

(See page 295)

(Photos W. S. Berridge, F.Z.S.)



1. BARBARY WILD SHEEP.

(See page 315)

2. GAYAL.

(See page 299)

(Photos W. S. Berridge, F.Z.S.)

a half of Bisons were destroyed, merely for the sake of the hides, the bodies being left upon the ground. Within the space of four square acres have been counted sixty-seven dead animals, which had merely been stripped of their skins and then left to decay.

Less than half a century ago the American Bison was one of the marvels of creation, in the multitude of its individuals in a comparatively restricted area. The rapid annihilation of a species of huge quadrupeds is unprecedented in the history of the animal world. The once mighty herds have been reduced to a mere handful of animals conserved by the United States Government in the Yellowstone National Park; but with a species so slow in natural increase it is but a question of time when this great race of Oxen becomes but a memory.

BUFFALOES.

The Buffaloes, another group of Oxen, differ in various particulars from any of the foregoing members of the tribe. In colour they are chiefly black, and generally thinly haired, so much so that the older animals are more or less naked. The horns are flattened and the section at the base is triangular. The European Buffalo (*Bubalus vulgaris*) is largely used in Southern Europe, Egypt, and Asia Minor in field work and as a beast of burden. The animal is a domesticated variety of a similar species that is a native of India.

INDIAN BUFFALO (*Bos bubalus*).

The Indian species, known as the Arnee, is the largest of the Buffaloes. It is a dusky animal, nearly six feet high at the shoulders, and possessing horns that sometimes attain a length of six feet. In the British Natural History Museum is a specimen nearly eighty inches in length. The animal is never far from the neighbourhood of water, and is exceedingly fond of wallowing in the mud, on which account it is often called the Water Buffalo. It not infrequently chews the cud while immersed in water, exposing little more than the head above the surface.

The Arnee lives in herds, often numbering fifty animals, and as they do not fight shy of settled districts they often break into cultivated land and work considerable damage. In disposition the animal is considered the fiercest and most dangerous of the Bovidæ; it will attack and knock down an elephant; and the tiger is by no means easy in its mind when in the Buffalo's vicinity. Hunting the animal in the low, damp jungles is consequently a sport not to be lightly undertaken. The grass and reeds usually hide even a fairly sized herd, making it exceedingly difficult to get a shot at any particular beast.

The animal is not domesticated to any large extent, and in subjection will not interbreed with the humped cattle. The wild species is not found outside Hindostan, and any similar animals in Further India and Malaysia are only the descendants of once domesticated Buffaloes.

CAPE BUFFALO (*Bos caffer*).

Of all the species and varieties of the Ox tribe in Africa, and they are many, the Cape or Black Buffalo is the most formidable. It is no whit better than its slightly bigger Indian relative, though from its appearance one might



HORNS OF THE CAPE BUFFALO.

judge it to be worse. The chief features of this African Buffalo are the broad muzzle, large ears, and the remarkable manner in which in the bulls the bases of the horns

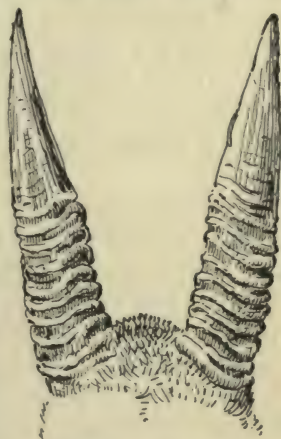
are flattened out. This horny helmet, from under which twinkle little fierce eyes, gives the animal a lowering, sullen aspect, in strict keeping with its real disposition.

Hunters sometimes assert that the Arnee will never charge a human being who will face it; but the Cape Buffalo knows

no such restraint. To the intruder into the marshy thickets it is far more dangerous than the lion. It is a disconcerting moment to find a blindly unreasoning animal, dripping with mud and bellowing with rage, suddenly launching itself upon one without the slightest preliminary warning. At other times a whole herd will be swept by a frantic impulse, which sends the animals crashing through the undergrowth with a recklessness that ensures the weaker of them being trampled to death. In chasing the Cape Buffalo it behoves the hunter to beware of a wounded animal, especially a bull, which will seek shelter in a thick bush, from which to charge immediately it sights its foe. The danger is increased by the natural horny helmet making it difficult to get a killing shot at the head, even at close quarters.

The Cape Buffalo fears nothing, whether it be on two or four legs. It was from one of these animals that Selous had one of his narrowest escapes, horse and man being overturned in an irresistible charge. The hunter was badly hurt and his horse had to be shot. It usually takes a couple of lions to pull down a full grown bull, although an old animal has gallantly staved off the attack of no less than three adult carnivores; and it is no unusual thing for a troop of cow Buffaloes to keep lions at bay all night in defence of their calves.

The Short-horned Buffalo (*Bos pumilus*) roams the plains and highlands of Western Africa. It is a smaller animal than the Cape Buffalo, varying in colour from yellowish-red to black. Though it has not got the huge flat horns and nothing like the horny frontlet, there is no doubt that it is closely allied to the foregoing species.



HORNS OF THE ANOA.

The Anoa (*Bos depressicornis*) of Celebes, on account of its slender build, its small size, and the straightness of its horns, was formerly considered to belong to the antelopes. On

the other hand, its thin covering of hair, the triangulation of the horns, which in the males attain a length of two feet, its barrel-like body, and its fondness for wallowing outweigh its antelope qualities.

MUSK OX (*Ovibos moschatus*).

Plate XXX. Fig. 1.

There is a difficulty in assigning this rather extraordinary animal to its exact place among the Hollow-horned Ruminants. As indicated in its generic name, *Ovibos*, it appears rather to form a link between the Ox and the Sheep. The Musk Ox has a coat of fine brown wool underneath its outer covering of very long hair, which reaches nearly to the ground. It is this latter which causes the animal to look much larger than it really is, for a hunter is quite satisfied to capture an animal weighing between three and four hundred pounds. But the distinguishing feature of the male is the appearance given to its head by the massive horns, the bases of which are spread out in almost exactly similar fashion to those of the Cape Buffalo. In the Musk Ox the horns take a downward direction, and when they do curve to form sharply pointed hooks, their tips end in about a line with the eyes.

Fossil remains prove that ages ago the Musk Ox inhabited Britain, a great part of Europe, and Northern Asia. Why it has disappeared completely from the Eastern Hemisphere no man can tell, but it is certainly now restricted to North America, practically the region lying between Hudson Bay and the mouth of the river Mackenzie.

Musk Oxen are gregarious, travelling in bands across the barren and inhospitable lands, where their food, especially in winter, is chiefly limited to lichens and mosses. A herd will unite to beat off their great enemy, the Arctic wolf; and the Eskimos assert that even bears frequently fall victims to their sharp and powerful horns. Hunters, however, find the Musk Ox by no means difficult to approach against the wind. If attacked from several points at once they form a circle, their glaring, blood-shot eyes bent upon the baying

dogs around them. This huddling together affords the hunter an excellent opportunity to shoot them down. Even if the herd stampede, very often curiosity will lead some of the animals to return to inspect a killed or wounded comrade, thus laying themselves open to meet the same fate.

The flesh of the animal has a musky odour which is very unpleasant at certain seasons in the year, but the Eskimos and Indians are not troubled with fastidious palates. Apart from food, the skin of the Musk Ox is a valuable sledge covering in these inhospitable regions ; and it always forms useful barter for ammunition, &c., from the white traders.

SHEEP AND GOATS.

In form, clothing, and habits there is no difficulty in distinguishing between the common varieties of Sheep and Goats. Yet if we attempt to fix upon the real distinctions which separate the one animal from the other, the task speedily appears well-nigh impossible. The coat, on the face of it, would appear to form the likeliest aid, but it fails us at the outset. The woolly coat of the domestic Sheep is due solely to the influence of man ; wild Sheep do not possess it ; and if tame ones are allowed to run wild in hot countries they soon exchange their covering of wool for one of hair, like that of the Goats. The horn, which is sometimes accepted as a distinction, has no real value, being variable to the last degree. In this connection the Rev. J. G. Wood mentions a woman who had several horns removed from her head. It is, therefore, evident that the horn cannot be accepted as affording any absolute means of identification. The beard of the Goat has been accepted as a distinction, but, as some of the Goats have no beards, while some of the Sheep possess slight ones, it is evident that the beard forms no real distinction at all, any more than it does among men. As most of us know, there are some races of men in which neither sex is bearded, while there are others in which both sexes always have beards ; and in our own race, although the rule is that a man has a beard and the woman has none, there are exceptional cases where the man is beardless and the woman has a beard which any man might envy. So

while we place the Sheep in the genus *Ovis* and the Goats in the *Capra*, we may very well consider that the terms are almost interchangeable, trusting to the descriptions of the various selected animals to afford us the few safe means of identification.

FAMILY OVIDÆ (SHEEP).

SHEEP (*Ovis aries*).

Coloured Plate XVIII. Figs. 1 and 3.

From the very earliest days the domesticated Sheep has been among the most valued of man's possessions; its history is blended with that of the laws and customs of nations; writers, sacred and profane, historians and poets of all times have abounded in allusions to it; and there is no more interesting and beautiful sight than hill and valley whitened with flocks feeding in peaceful security. Such a scene takes us back to the patriarchal days, when a pastoral life was the chief condition of men, and when the office of shepherd was an occupation of chiefs and even princes. The Sheep is the first animal mentioned by name in the sacred writings. The firstlings of the flock were offered in sacrifice according to the Jewish ritual; the Lamb was a type of innocence and purity; and as the Antitype of these sacrifices Christ is expressly called the 'Lamb of God, that taketh away the sins of the world' — 'a Lamb without blemish and without spot.'

We may forgo any detailed description of an animal with which all are so familiar, simply remarking that in many of the domesticated varieties horns are so little developed that it may be said that they are almost absent. In others they are comparatively large in the male, curving downwards and not infrequently upwards again. An



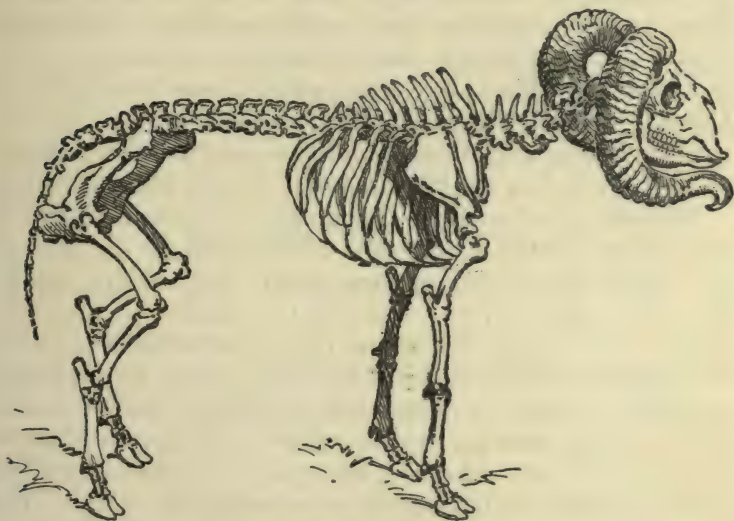
BONES OF THE
FORE FOOT OF
THE SHEEP.



FOOT OF THE
SHEEP.

irritated ram is no mean opponent, and his impetuous charge will lay low a bull at the first blow.

It is impossible to say from what wild species the domesticated Sheep is derived, as it would be profitless to attempt to enumerate the breeds, which in every country present more or less peculiar modifications. Sheep-breeders everywhere aim at producing in their animals either specially fine wool or meat of superior quality, and in some of even the common breeds these two features are largely combined. The covering of the wild Sheep consists chiefly of hair, with



SKELETON OF THE SHEEP.

wool at the roots, much as a coating of down lies beneath the feathers of some birds. In the course of domestication the hair has practically disappeared, while the wool has been developed into the thick, soft fleece that contributes so largely to the clothing of mankind.

Of all the breeds of Sheep, the Merino of Spain is noted for the excellence of its wool. Unfortunately the British climate is unfavourable to its introduction into our own country, but it has been transferred to many parts of the world with excellent results. Australia at the time of its discovery possessed no Sheep of any kind of its own.

Little more than a century ago a couple of score were imported into Sydney from India, and later additional stock was introduced from England and the Cape of Good Hope; the latter were Merinoes.

There are now in Australia over sixty million sheep, or about fifteen per head of the population; whereas in the British Isles there is not one animal per head. New Zealand received its first Sheep in 1840, and now there are twenty millions—chiefly the Southdown breed—on the sheep-farms of the colony, or over twenty-five per head of the population. It can readily be seen how wool and mutton form no inconsiderable share of the wealth of our kindred across the seas, wealth more assured and enduring than even the gold that has been mined under the Southern Cross. The Argentine Republic possesses over seventy million Sheep, and there are large numbers in America and South Africa, the Merino breed largely predominating.

Mention may be made of but a few of the best known of our native breeds, which vary considerably in size and in the length and quality of their wool. They thrive best in the drier regions of the east and the chalk and limestone areas of the south. Elsewhere the animals flourish best on the easily drained hillsides of the west, and on the southern uplands of Scotland rather than the plains. As a rule, the Sheep of the west are reared mainly for food; in the east the quality of the wool is a very great consideration. The humid climate of Ireland is unfavourable to Sheep. The Southdowns of the chalk hills have rather small heads, from which horns are absent. They are noted for their fine, short wool, and they yield more meat than other animals of anything like similar type. The Norfolk and Dorset breeds are horned in both sexes. Of the long-woolled breeds the Cotswold Sheep deserve first mention, if only for the fact that early in the fifteenth century some of them were imported into Spain. There they were crossed with Merinoes, resulting in an improvement even in the fleeces of the famous Spanish Sheep. Welsh Sheep thrive on the sparse mountain pastures; they are small, but noted for the excellence of their meat. The Cheviot, its location identified in its name, yields wool of moderate fineness and

meat of good quality. The Sheep of the Shetlands and Orkneys are small and hardy, frequently horned, and varying in colour from white to black. Their soft, fine wool is largely mixed with silky hair.

Some breeds of domesticated Sheep have remarkably broad tails. A Palestine variety (*Ovis laticaudatus*) possesses an enormous, heavy, laterally developed tail, which quite commonly reaches a weight of from ten to forty pounds, while a weight of sixty or seventy pounds is not unknown. Similar animals are found in Tartary, Arabia, Persia, and Barbary. The tip of the tail is horny, and in many cases trails upon the ground. Very often animals are supplied by the shepherds with little sledges on which to support their specially weighty appendages. The fat tail was a part of the peace-offering as ordained for the Hebrews (Lev. iii. 9).

MOUFLON (*Ovis musimon*).

Coloured Plate XX. Fig. 1.

The merest glance at the illustration bears out the earlier remarks concerning the close affinity of the Sheep and Goats. In appearance the animal is nothing like the domestic Sheep, yet the Mouflon is only its wild relation of Corsica and Sardinia. Even if we felt inclined to query the relationship between the domestic species and this alert-eyed mountain creature, the animals themselves are in no doubt upon the matter. A Mouflon will frequently stray into the valleys and join a flock of tame Sheep, and a deserted lamb will seek comfort with the Mouflons, if opportunity is only afforded it.

The Mouflon only stands about thirty inches at the shoulder, but what it lacks in size is atoned for in vigour, for it is by no means the rather helpless animal of the domesticated kind. It is active and agile, springing up rocky heights with the greatest ease and rapidity; and so difficult of approach is it, that only exceptionally good shots can hope to add it to their bag.

In colour the animal is brownish-grey or foxy red, with

various streaks upon the body, and the under parts white. The horns vary from twenty to thirty inches in length. In summer the hair is close, like that of the deer; in winter it is rough and wavy, concealing at its roots a fine, white, woolly down. The young, when first born, are covered with a soft, grey fleece, which changes into hair as the animal grows older.

In the warmer parts of the year the Mouflon keeps to the higher elevations, living chiefly on the young shoots of Alpine plants; but with the approach of the cold season the animal descends to the lower slopes and feeds mainly on grass. It was formerly very abundant, and at one time as many as four or five hundred animals were killed in a single drive. Nowadays the herds are only parties numbering about half a dozen, consisting of a ram and several ewes; and a well-organised hunt would not witness the capture of more than fifty animals.

ARGALI (*Ovis ammon*).

Coloured Plate XX. Fig. 3.

The Argali, the largest of the wild Sheep, is a handsome animal found in Mongolia, Eastern Siberia, Tibet, and Central Asia generally. Any differences in the animals of these regions are mainly concerned with their size and a varying twist in their horns. Early naturalists regarded the Argali and the mouflon as the same species, but comparison of the two animals figured on the plate appears almost sufficient in itself to negative the idea.

In summer the animal's smooth coat is a dark greyish-brown above and whitish below; in winter it assumes a reddish tinge and the hair is harsher. But the most prominent feature is the great horns, massive and roughly ringed, curving downwards and then upwards. In the finer specimens the horns attain a length of forty-eight inches, with a girth of twenty at the base. Even an animal of only average size carries a weight upon its head of quite forty pounds.

The Argali is less of a wanderer than many other species of wild Sheep, frequenting the same particular mountain



1. Mouflon



2. Chamois



3. Argali

TO THE
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region, unless there is a failure in the supply of natural food. It is an extremely hardy animal, even in winter seldom descending lower than 12,000 feet, at which elevation only lichens are procurable, and even that poor food is only available in the most exposed situations, where the icy blasts have swept away the deep snow.

Travellers assert that the Argali can leap from a height of thirty feet, alighting without the semblance of a stumble. Inhabiting only the most barren and desolate mountain regions, the rams in particular are considered to be most difficult animals to stalk. Not only when they are feeding, but also when they are sleeping, the Argalis post sentinels; and from the very nature of the country it is almost an impossibility to approach within gunshot without the animals taking alarm.

There are numerous other species of wild Sheep that call for only brief attention. The Kamschatkan Wild Sheep (*Ovis nivicola*) and the Pamir Wild Sheep (*Ovis poli*) have their habitat indicated in their names. This last-named is also known as Marco Polo's Sheep, so called because the



HORNS OF THE PAMIR SHEEP.

famous traveller was the first to describe the animal. The Urial (*Ovis vignei*), a bearded Sheep, is found in the Western Punjab, Baluchistan, Afghanistan, and part of Persia; under the name Sha the same animal extends as far as Northern Tibet. No other Old World Sheep has so wide a range.

The Barbary Wild Sheep (*Ovis tragelaphus*), Plate XXIX. Fig. 1, or Arui, is the only wild member of the family found in the whole of Africa. In appearance it differs from any other species in the possession of very

long hair on the chest and fore legs. In one habit at least it is very unlike any of the foregoing members of the family. In the face of danger it prefers to hide rather than take to immediate flight, and as its colour largely approximates to its ordinary surroundings, so long as it lies perfectly still, the hunter can perceive it only with the greatest difficulty.

The Bighorn (*Ovis canadensis*) is the American Argali, found chiefly in the Rocky Mountains. It is six inches higher than the Asiatic species, and possesses much the same massive horns. It is stated on good authority that a flock of these animals will not hesitate to leap down a cliff a hundred and fifty feet in height. Hunters experience great difficulty in approaching the Bighorn; but the Indians fasten horns to their heads, and thus frequently deceive the animals until they are within shooting distance. But the Bighorn is getting increasingly rare, and the time is approaching when hunters, white or red, will cease to count the animal among their spoils.

FAMILY CAPRA (GOATS).

COMMON GOAT (*Capra hircus*).

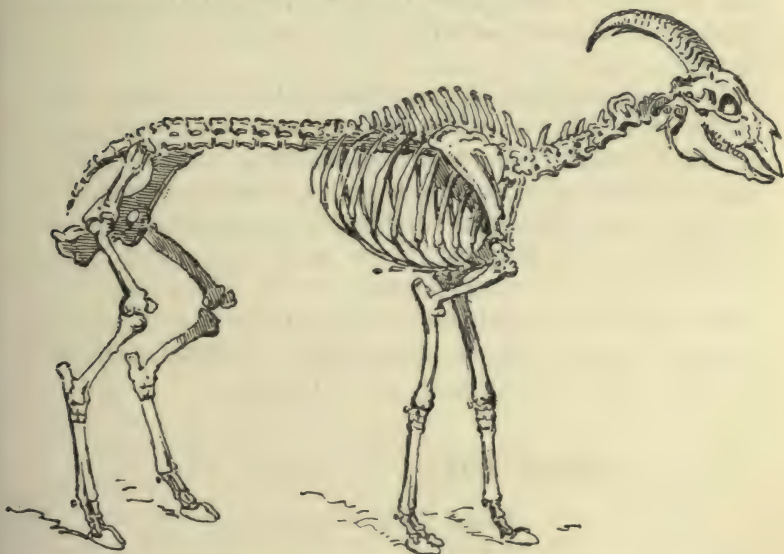
Coloured Plate XVIII. Fig. 4.

In the sheep family, and especially the domesticated breeds, the horns curve over the side of the face; but in the Goats the spiral or curving adornments appear close together just over the eyes, rising upwards with a backward sweep, often to a great length in the males. In some species the horns are absent in both sexes; in others those of the male are quite unlike those of the female; and in yet other cases an animal may possess four horns. It should be noted that in Goats generally the horns are less cylindrical than they are in the sheep. Most Goats are bearded; and all the males are marked by a peculiar, almost offensive, odour, which is given off by a scent gland.



FOOT OF THE
GOAT.

The common Goat for long ages has been domesticated for the sake of its flesh and milk, and for its coat, which is usually less woolly and coarser than that of the sheep. There is, however, as much diversity in the covering as there is in the horns. In some kinds the hair is as short as that of a horse, while in others it nearly reaches the ground. In colour it may be white or black or any shade between. The ears may be short and upright, or long and pendent; and altogether some of the types are so unlike as to cause one to doubt that they belong to the same family.



SKELETON OF THE COMMON GOAT.

The domestic Goat is believed to be descended from the ibex. It was one of the clean beasts, which was permitted as a sacrifice and for food to the Israelites. Among the patriarchs large herds of Goats denoted their wealth; and in many countries, especially in the East, there are vast herds that are still a source of wealth and comfort in the regions they occupy. The same shepherd who looks after the sheep often also herds the Goats, and they mingle in their search for food. At night, or when being driven, they keep apart in separate droves. In such cities as Damascus

the milkseller drives his Goats through the streets, milking at the door of the house the particular animal which the customer prefers.

Although, like the sheep, the Goat will feed upon grass or hay, it has a decided liking for bark, and is in consequence best kept where it can work no harm to the trunks of young trees. Goats have done much to exterminate shrubby vegetation in Southern Syria, and have thus assisted to keep the country in a desert condition. Goats were introduced into St. Helena in 1513. The result has been that the island forests were thinned, involving the total disappearance of many valuable trees, among which was the ebony.

The Goat is not an important animal in the British Isles ; in fact, it is little reared anywhere amid cultivated tracts. In disposition it is more restless, curious, and adventurous than the sheep, and ordinary fences are useless in restricting it to any given area ; and consequently goat-herding is only important where there are tracts of wild land over which the animals can wander almost at will. There are quite a dozen species of wild Goat, and of the domesticated kind there are varieties almost innumerable. A selection of each, therefore, must serve for the whole family.

ANGORA GOAT (*Capra hircus*, var.).

Plate XXX. Fig. 2.

The Angora Goat is one of the most elegant of all the numerous domesticated varieties. It is usually of a milk-white colour, and has black, spreading, spirally-twisted horns and pendulous ears. Its hair, long, wavy, and silky, is of remarkable fineness, and it covers the body of the animal in long spiral ringlets. The herdsmen regularly wash and comb the fleeces to prevent the hair matting and deteriorating.

The hair was first brought to England under the name 'mohair,' the Turks at first strongly objecting to its exportation. Since that time the Angora Goat has been introduced with remarkable success into the Southern United

States, Australia, and South Africa. The last named exports hair annually to the value of sometimes as much as three-quarters of a million pounds sterling. In England the Yorkshire mills absorb most of the imported raw material, which is converted into fine shawls, velveteens, braidings, and trimmings for gentlemen's coats.

KASHMIR GOAT (*Capra hircus*, var.).

The Kashmir Goat is really most abundant in Tibet and the Kirghiz steppes region ; but it has been introduced even into Central Europe. It is a small animal which is highly prized for its long, fine, silky fleece, which varies in colour and weight with the altitude at which the Goat is pastured on the high mountain slopes. In the lowest vales the animal is nearly pure white ; it takes on a yellowish tinge in the more elevated regions ; while it is of a bright ochre colour in the highest altitudes. Below the coarse upper hair is fine curled wool close to the skin, and it is this fine material which is converted into the beautiful and costly shawls for which Kashmir has long been famous. It is said that an animal only yields three ounces of the finest wool, and the product of ten Goats is required to make a shawl one and a half yards square. The fabric is woven by slow hand processes, a coloured pattern often occupying four persons for a whole year. British and French machine weavers now manufacture the closest imitations of the coveted Kashmir speciality, at a price far less than the patient Asiatic craftsman can produce them.

IBEX (*Capra ibex*).

Coloured Plate XXI. Fig. 1.

Of the wild Goats the Ibex is the likeliest forbear of the domesticated species. It is the wild Goat of Europe and Western Asia, and there are varieties in the Himalaya, Abyssinia, and Southern Palestine and Arabia. It was this last named which is believed to have been hunted by Jacob, when he was in search of venison for his father, Isaac.

Of all the varieties the best known is the Ibex of the European Alps. In one sense it can scarcely be called a wild Goat nowadays, for it is practically restricted to the Piedmont side of Monte Rosa, where the Italian Government has protected it from complete extermination. Wild Goats as a rule frequent more rugged country than even the wild sheep; the Pamir Sheep is found at a height of 20,000 feet, but even then it is still in comparatively open country.

The Ibex stands about three and a half feet high. Its rather harsh hair is a deep hoary brown in summer, and yellowish in winter. To support the thick, short body the legs are stout and strong; the fore legs are slightly shorter than the hind ones, and hence it is better able to ascend than descend, and in flight always seeks the highest points. It is wonderfully sure-footed, and can descend clefts, or 'chimneys' as they are called, simply by cannoning from one side to the other.

The horns of the animal, transversely ridged, are quite two feet long in the male. It used to be believed that when the Ibex climbed to some inaccessible spot from which it could not retrace its steps, it gathered its feet together, bent its chin on its breast, and flung itself off the precipice, falling on its horns, and bounding from ledge to ledge until it reached level ground. Suppose this were really so in the big-horned males, what was to become of the more valuable females when they were in a like predicament? Their smaller horns would certainly be unable to render similar useful service. It has been clearly proved that the horns have no preservative uses, a remark which equally applies to the argali, another animal that was also once connected with the pretty theory.

The Ibex is shy and wary to a degree. Hunting the animal is dangerous, not only on account of the precipitous regions it frequents, but also because when pressed it will turn on its pursuers with quick impetuosity, with the chance of a hunter being hurled down some steep declivity. The female seldom has more than one young at a time. She is a devoted mother, and will fight even an eagle to the death in defence of her offspring. When caught young the animal is easily tamed; it is, however, rather an unsatis-



1. MUSK OX.

(See page 308)

2. ANGORA GOATS.

(See page 318)



1. TAHR.

2. MARKHOR.

(Photos W. S. Berridge, F.Z.S.)

factory pet, usually preferring to spend the greater part of its time on the roof of the house.

The Himalayan species (*Capra sabirica*) is a very similar animal to the Alpine Ibex. A well-grown buck will stand forty or forty-two inches at the shoulder ; a doe is usually quite one-third smaller. Horns frequently attain a length of forty-two inches, though they have been known to exceed four feet. Frequenting varying altitudes according to the season of the year, they are so familiar with the noise of falling rocks and avalanches that they do not necessarily take alarm at the sound of a gun ; but let one of the animals perceive anything suspicious, and it will issue a warning whistle that will send the herd madly racing to a place of safety.

MARKHOR (*Capra falconeri*).

Plate XXXI. Fig. 2.

The Markhor, the king of wild Goats, inhabiting the North-west of India, Afghanistan, and neighbouring regions, is larger than the ibex. Its great flattened horns sometimes exceed five feet in length ; they are twisted, but with only a few turns. Like the ibex the males have a large black beard, and in the older animals the long hair is extended to the chest and shoulders, very much in the same fashion as the Barbary Sheep. It seeks rocky mountain forests, and consequently can reach cover more quickly than in the open mountain country. The Markhor has but little underfur, and the cold weather causes it to descend to comparatively low regions. An animal in confinement at the Zoological Gardens, notwithstanding it was hampered by a heavy chain, always contrived to reach the top of the wall of its pen.

TAHR (*Hemitragus jemlaicus*).

Plate XXXI. Fig. 1.

The Tahr, a Himalayan Goat-like animal, is one of several species that differ in various particulars from the

true Goats, but especially in the absence of a beard. The male is generally from three to three and a half feet in height at the shoulder; the horns seldom exceed fifteen inches in length. The doe, a smaller animal, has four teats instead of two, as in the sheep and other Goats. The coat is fawn brown in colour, and is long on the neck, chest, and shoulders. The home of the Tahr is chiefly in the elevated forest regions of the Himalaya; and it frequents such almost inaccessible spots that, when shot, the animal often falls down precipices, where the hunter cannot secure his prize.

Other wild Goats are the Pasang (*capra ægagrus*), a Persian species, with large scimitar-shaped horns; the Spanish Wild Goat (*Capra pyrenaica*), often mistakenly called the ibex, which is found in the Pyrenees and the central mountains of the Iberian Peninsula; and the Tur, or Caucasian Wild Goat (*Capra cylindricornis*), which is very closely allied to the sheep. But in form and habit they differ only in unimportant details from the last two species more fully described.

FAMILY ANTILOPIDÆ (ANTELOPES).

This great family of the Hollow-horned Ruminants includes a vast number of animals, some rivalling the largest oxen in stature, and some being so small that they are to the Eland and Gemsbok what the toy terrier is to the mastiff or Newfoundland dog. The majority of them are medium-sized animals of graceful build and about the same calibre as the deer. Like the wild sheep and goats, their flesh is excellent eating, but they only come within reach of the hunter or the natives of the regions inhabited by the different species of the family.

The Antelopes are divided and subdivided by zoologists into many, more or less, complicated sub-families, differing from each other in many cases in points almost too trivial for notice in a general survey. In not a few cases it is difficult to distinguish the animals from oxen on the one hand and goats on the other. Really, the great family is

confined to the Old World, Africa with nearly a hundred species containing the bulk of it; in Europe and Asia there are but a few; and in North-west America a still less number of species.

Usually the body of an Antelope is supported on slender but vigorous limbs, constructed for the utmost speed, the hinder legs being the longer and the haunches elevated accordingly. The head, beautiful in contour, is almost invariably small. The eyes are large, full, and brilliant. In most cases both sexes have horns, always cylindrical and set closely together. Many of the horns are marked by transverse ridges; some are perfectly straight; some are spirally twisted; and they are hooked backwards or, in few cases, forwards. There are no upper incisor or canine teeth, but in the lower jaw are three incisors and one canine on each side. There are twenty-four molars, six on each side, top and bottom. The hair is generally sleek and close.

Practically all the Antelopes inhabit open plains, eating grass and other vegetable food. They are as fleet as the wind, and as their speed is their only defence, they are endowed with sight, hearing, and smell to perfection, allowing them to perceive the approach of enemies while they are yet at a distance. There are many regions, particularly in South Africa, where Antelopes once roamed practically undisturbed, but as these tracts are more and more opened up to civilisation and human society advances, the Antelopes retreat to the still further wilds and solitudes.

It is impossible to include many of the different species, but the following selection may be accepted as typical representatives of the great Antelope family.

CHAMOIS (*Rupicapra tragus*).

Coloured Plate XX. Fig. 2.

The Chamois is sometimes classed with the goats, sometimes with the Antelopes, while some zoologists prefer to separate it into a distinct group. It may best be accepted as the only Antelope of Europe, being an inhabitant of the Alps, Carpathians, Greece, and the Caucasus.

In size, and especially in the appearance of its head, the Chamois generally resembles a large common goat. Its dark brown hair, close, thick, long, and coarse, with an undercovering of woolly fur, is well calculated to repel cold, and also to protect the animal against bruises, to which it is constantly liable. The tint of the head is lighter than that of the body, except for a dark streak from the eye to the corner of the mouth. The animal's horns are black, smooth, and straight for two-thirds of their length of six to ten inches, when they suddenly curve backwards into a hook. The hoofs are concave at the base, there being a projecting edge on the outside admirably adapted to avail itself of any little unevenness in naked granite or icy glacier. It is said that the Chamois can gather its four feet together and stand on a rocky pinnacle the top of which is only the size of a crown piece.

The Chamois is really a mountain forest dweller, but in summer, numbers of the animals always resort to the more open mountain heights and plains, in families or small flocks of from fifteen to twenty. The hunting of the Chamois is a most perilous undertaking, always with the possibility of falling over the brink of a precipice, or of being buried in some chasm beneath the treacherous snow.

When feeding upon the herbage of the mountain sides the herd is always protected by a sentinel, placed on some adjacent rock which commands a view of every way of approach. When danger threatens it makes a loud hissing noise, and off the creatures bound where the eye can mark no footing, from crag to crag, from point to point; they clear the chasm, they sweep over the glacier, they throw themselves down the precipice, pitching as if by a miracle on the slightest projection. It naturally follows that to be successful in his quest the hunter must possess the highest skill and uncommon powers of endurance.

The skin of the animal is manufactured into a soft, pliable leather, often called wash or buff leather, which is exceedingly useful for polishing purposes. More often than not the so-called Chamois leather was once the covering of the common goat or the sheep.

GAZELLE (*Gazella dorcas*).

Coloured Plate XXI. Fig. 3.

The Gazelle, of which there are at least a score of species, is one of the most typical of the Antelopes. One of the best known is the one figured on the plate. Its specific name is familiar to all those acquainted with the Scriptures as that of the 'certain disciple named Tabitha, which by interpretation is called Dorcas,' *i.e.*, a Gazelle, who was restored to life by St. Peter (Acts ix. 36, &c.). It has a very wide range of country—Algeria, Egypt, Palestine, Syria, and parts of Asia Minor. Under the name of the *Roe* are many Biblical allusions to the animal, praising its swiftness, grace, and gentleness; and in all ages it has been eulogised by poetical writers.

The Gazelle, only two feet high at the shoulder, is a beautifully sleek animal, light fawn colour on the back, passing into a brown band along the sides, which forms an abrupt border to the white of the under parts. The hind-quarters are also mainly white. The face is curiously marked with two stripes, one dark and one light. Its eyes are large, soft, and lustrous. Its whole appearance well harmonises with its customary desert surroundings. The horns seldom exceed thirteen inches in length. The legs of the animal are as slender as a reed, by which it is enabled to skim over the ground almost like a bird, often taking leaps of a yard in height as it pursues its rapid flight. No wild beast ever attempts to catch it in open chase; it can only be struck down by stealing upon it unobserved. The graceful creature is easily tamed, and is always a great favourite in Syria.

The Indian Gazelle (*Gazella bennetti*) ranges through Central and North-west India, Baluchistan, and Persia. It is most abundant in absolutely desert regions. Tame Gazelles readily herd with goats; and it is no unusual thing even for wild ones to join a herd of their own accord. One of the largest of the family is the Senegal Gazelle (*Gazella mohr*), which is thirty-two inches high, with horns over a foot in length.

SPRINGBOK (*Gazella éuchore*).

This animal is practically the gazelle of South Africa, gaining its name from its habit of leaping up seven or eight, or sometimes as many as twelve feet when it is in full flight. Its specific name means a good dancer. Before the South African War the animal was found in the north-west of Cape Colony and the Transvaal ; but the Kalahari Desert and adjacent regions are where the Springbok is now found in greatest numbers.

In form and colour and horns the animal closely resembles the gazelle, though it usually stands six or seven inches taller. A distinguishing mark of the species is a



HORNS OF THE SPRINGBOK.

line of long white hairs arising from between a double fold of the skin along the middle of the back ; in a state of rest the edges of the fold lie close, so as to conceal in a great measure the snowy stripe ; but as soon as the animal leaps, the long white patch becomes visible, and has rather a startling effect.

The most interesting part of the history of the Springbok relates to its occasional migrations from the semi-desert regions it inhabits, when in a season of drought no thunderstorms replenish the pools, every green thing withers, and the whole scene becomes one of barren desolation. Before the settlement of South Africa had made such progress, and when the Springbok roamed the wilds in countless thousands, there was no more interesting sight in the whole of the African continent than a herd of Springboks, driven by necessity to seek more fertile plains whereon to rear the young fawns.

Gordon Cumming graphically describes the first of these migrating herds that he had seen, and mentions that for two hours he watched the herd moving in a solid mass, measuring at least half a mile in width. These moving herds are called 'trekbokken,' and they are of such vast

TO VINU
ANBOGLIAO

Plate XXI.



2. Equine
Antelope



1. Ibex



3. Gazelle



4. Waterbuck

dimensions that a lion which has tried to snatch a Springbok out of a herd has been unable to extricate himself, and in the most humiliating manner has been obliged to march with the herd, unable even to feed upon any of the animals which pressed him on every side. A flock of sheep has also been enveloped in one of these 'trekbokken' and carried off.

The ordinary migrations of the Springbok are in an easterly direction, but at intervals of about twenty years an opposite course is taken. After existing for months without water, the animals seem to be impelled to slake a suddenly tormenting thirst. Only a few years ago there was a great 'trek' to the sea, where the creatures drank greedily and then died in tens of thousands. For many miles the dead bodies lay along the shore, presently to putrefy and drive the few inhabitants of the region far inland for fear of pestilence.

GEMSBOK (*Oryx gazella*).

There are half a dozen species of the genus *Oryx*, ranging throughout many of the desert regions of Africa and extending into the south-west of Asia. The Gemsbok, one of the finest of the group, is a South African Antelope, chiefly roaming the Kalahari region. It stands nearly four feet high at the shoulder, and is generally about the size of the domestic ass. In colour it is greyish above, deepening in shade on the haunches and the upper parts of the limbs, a black flank stripe separating it from the lighter under parts. There are distinctive markings on the face, a black patch appears on the forehead, and similarly coloured stripes run from the horns, enveloping the eye and reaching nearly to the muzzle. The long, straight horns, as in some other species of Antelopes, are sometimes longer in the females than in the males. For half their length they are very definitely ringed, after which they proceed to sharp points that form rather terrible weapons.

The natives of South Africa often asserted that the Gemsbok was quite independent of water, which was in due course confirmed by Gordon Cumming, who says that the

animal 'thrives and attains high condition in barren regions where it might be imagined that a locust would not find subsistence. From my own observation and the repeated reports both of the Boers and the aborigines, I am convinced it never by any chance tastes water.' This applies with equal truth to many Antelopes that roam arid regions. The animals require moisture, which they procure from various succulent plants that collect and retain whatever moisture the atmosphere affords. They are chiefly bulbous plants, one of which is known as the water-root.

The Gemsbok is far less fleet than many of its kind, and it is frequently run down by means of horses and dogs. When in extremity the animal is a dangerous foe, for it lowers its head to the ground and strikes right and left with wonderful rapidity. Even a lion has been killed by the Gemsbok, being received on the sharp points of the horns and pierced through the breast. The Gemsbok's neck was broken by the shock, and so both animals were killed.

The Oryx proper (*Antilope oryx*) differs but little from the foregoing, except that it is six inches less in height, and its horns, instead of being straight, are bent back into a fine curve. It is resolute and dangerous if hard pressed, and when the dogs surround it, not infrequently several will be wounded before the hunters can come up. It uses its horns with amazing address and adroitness, and with such violence as to keep a whole pack at a safe distance.

Differing in only a few trifling particulars is the smaller Beatrix Antelope (*Oryx leucoryx*), Plate XXXIII. Fig. 2.

EQUINE ANTELOPE (*Hippotragus equinus*).

Coloured Plate XXI. Fig. 2.

Very closely allied to the oryx are the Roan and Sable Antelopes. The Roan, or Equine Antelope of Central South Africa, is typical of practically any animal included in the genus. It is a handsome beast, standing nearly five feet high at the shoulders. The colour of the hair varies considerably; usually it is more or less roan, but sometimes it is dark grey or brown. Some brown and white markings on

the face are very distinctive. The horns, curving and ridged, on the average seldom exceed three feet, but in specially fine animals will run to another half-dozen inches.

The Sable Antelope (*Hippotragus niger*) is most abundant in Mashonaland and neighbouring regions, where the herds number from ten to twenty individuals. There appears to be no two opinions concerning the striking handsomeness of the animal. Says Gordon Cumming, 'I shall never forget the sensation I experienced on beholding a sight so thrilling to the sportsman's eye; he stood with a small troop of palas right in our path, and had, unfortunately, detected us before we saw him. Shouting to my pack, I galloped after him; but the day was close and warm, and the dogs had lost their spirit. My horse, being an indifferent one, soon lost ground, and the beautiful creature, gaining a rocky ridge, was quickly beyond my reach, and vanished for ever from my view. I sought in vain to close my eyelids that night, for the image of the Sable Antelope was still before me.'

WATERBUCK (*Cobus ellipsiprymnus*).

Coloured Plate XXI. Fig. 4.

The genus *Cobus* includes various Antelopes, which in their love of water present a great contrast to the great majority of the Antelope family. Of these the Waterbuck will serve as an excellent example. Standing four feet high or more at the withers, the animal is principally reddish-brown in colour, with an elliptical patch of white on the hindquarters, and small patches of the same colour adorn the face. The hair is long and coarse. The horns vary from two to nearly three feet in length along the curve; they are slightly lyrate and ringed nearly from their base to their tips.

The Waterbuck is found in South and Eastern Africa, especially in the valley of the Zambesi. The animal varies somewhat in habit in different regions, sometimes frequenting stony uplands, perhaps a mile or more from a river; in other cases, as in Nyassaland, selecting swampy plains,

where the tall grass and reeds afford plenty of cover. The animals always make for the water when disturbed. It is a peculiarity of the Water Antelopes that as long as they can bottom the water they do not attempt to swim, splashing along in a series of bounds. Not infrequently they stand in water up to the tops of their legs, cropping the aquatic plants. The Sing-Sing (*Cobus defassa*) is a rather smaller animal exactly similar in habit, but with long, silky hair.

ELAND (*Taurotragus oryx*).

Coloured Plate XXII. Fig. 2.

The Eland, or Impofo, is the largest of the Antelopes. Standing nearly six feet high at the shoulders and with a length of nine feet, it is more heavily built than any other of the Antelope family, equalling in bulk the domestic ox. The Central African variety is pale fawn in colour, but that of South Africa is a bright yellow tan, as shown in the illustration; in old age, however, the colour may darken to bluish grey.

The Eland possesses a well-marked dewlap, which is fringed with black hair similar to that of the short mane; the tail, two and a half feet in length, is well tufted with brown hair. From the head, light, graceful, and bony, project two strong, straight horns, usually a couple of feet in length; they are twisted in an open spiral. At one time herds of from fifty to a hundred animals were common, but except in the more remote districts it is now limited to small parties. It is doubtful if any specimens remain in Cape Colony, Natal, Orange River Colony, and the Transvaal; but it is fairly common in Nyassaland and the Kili-manjaro region.

The flesh of the Eland is very tender, even when fresh killed; the skin is highly valued for many purposes, and the marrow is one of the greatest dainties for which a hunter can wish. The animal quite commonly weighs twelve hundred pounds, while old bulls will approach two thousand pounds; these heavy animals are rather easily ridden down. At one time this Antelope was introduced



1. Gnu



2. Eland

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into Europe with a view to breeding it for its flesh, but the animal's ravenous appetite made it an unprofitable undertaking.

GNU (*Connochætes gnu*).

Coloured Plate XXII. Fig. 1.

The two species of Gnu are certainly the strangest-looking of the Antelopes, and they well deserve their common name 'Wildebeest,' which is gained for them by their wild manœuvres as much as by their awkward and uncouth appearance. In colour, the species figured on the plate is mainly dark brown, except for the black mane streaked with white at its base and a long white tail. There are tufts of hair on the muzzle and under the chin, together with a ruff of black hair on the neck and extending to between the fore legs.

This extraordinary animal is equal in height to a small pony, and its general contour is compact and very muscular. The head is abnormally large and the eyes are wild and fiery. The horns, large and ponderous, scarcely advance from the skull, taking an oblique direction outwards, and then rising again towards the points, which are long and sharp. The horns overshadow the animal's eyes, giving it a suspicious and sinister aspect, and hence another generic name (*Catoblepas*), which means 'downlooking.'

The ancient naturalists thought the Wildebeest to be a hybrid between a horse and a cow, and in travelling menageries it is generally advertised as the 'Horned Horse.' It has the odd habit of mixing with zebras, giraffes, ostriches, &c., in a most miscellaneous herd. The colour scarlet has for it the most astonishing fascination, so that when the hunters wish to attract it within rifle-range, all they have to do is to tie a red cloth to a stick, allow it to wave in the air, and wait for the Gnu, which cannot resist the temptation of inspecting the scarlet object. Every now and then, even in captivity, the Gnu is seized with an irrepressible desire to dance, kick, and bark. Accordingly, down goes its head to the ground, up go its heels into the air; then it pretends to toss some enemy to the sky; then

prances up and down like a rocking-horse worked by machinery ; then executes a series of pirouettes, and all the time emits a string of sharp, loud barks which can be heard at a great distance, and, in a menagerie, pierce through the roars of lions and tigers.

This White-tailed Gnu is strictly a South African animal ; but there is another species, the Blue or Brindled Gnu (*Connochætes taurinus*), which is more or less common from the edge of the Kalahari Desert, through the Eastern lake regions to Kilimanjaro. Thanks to the fact that the Wildebeest is as wary as it is tenacious of life, and also that the flesh is of little value, the native hunters kill fewer of the animal than of any other species of Antelope. Before the war it was calculated there were not more than two thousand Gnus in South Africa ; there are now probably less than half that number.

NILGAI (*Boselaphus tragocamelus*).

Plate XXXII. Fig. 2.

The Nilgai, or Blue Ox of India, standing five feet high at the shoulders, is the largest of the Asiatic Antelopes. The females are usually tawny red in colour, while the males are generally slate blue, the under parts being darker and the legs nearly black. Very old bulls are nearly quite black. White lines, one above and one below the fetlock, are conspicuous marks on the elegantly shaped limbs. The hind legs are rather shorter than the fore limbs, which gives the animal a somewhat ungainly appearance, but its gait, though apparently clumsy, is very rapid. The horns of the male are short, smooth, and straight ; the female is hornless.

The Blue Ox, in herds of fifteen to twenty, frequents the thickly wooded plains or low hills of Central India. It grazes and browses, and, like the giraffe, seizes leaves and other food with its tongue, instead of its lips. The animal is shy and wary, and to effect its capture considerable woodcraft is necessary. In the open it can be hunted on horseback and speared. It is difficult to kill the Nilgai, and



1. YOUNG PRONGHORN

(See page 333)

2. NILGAI ANTELOPE.

(Photos W. S. Berridge, F.Z.S.)

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frequently it will get away, even though shot in several places. It is dangerous at close quarters, dropping upon its knees until it is able to make a sudden leap at its enemy. The animal is not much hunted by the natives, as the Hindoos class it as a member of the Ox tribe, the flesh of which is not partaken. The skin is useful, but the horns are a very insignificant trophy of the chase.

PRONG-HORNED ANTELOPE (*Antilocapra americana*).

Plate XXXII. Fig. 1.

The Prong-Horned Antelope, or Prongbuck, is one of the very few species found in the New World. The horns of the animal, as indicated in its name, are branched, and they are shed every year. In these two respects it differs from all other of the Hollow-horned Ruminants.

The animal, which in America is often called the Antelope, pure and simple, is about three feet in height at the shoulder. Lightly and gracefully built, and carrying its head high, its coat is chestnut in colour, with the hind-quarters and under parts white. The face is dark-brownish with white on the top of the head, the ears, cheeks, and chin. Across the throat are three bars of russet yellow.

The chief point of interest in the Pronghorn concerns its horns, which in structure are very similar to those of the sheep and goats. About a foot in length, they are flattened from side to side, bending backwards at their tips. From about the middle of their length is thrown out a short branch, which is directed outwards. Hunters frequently asserted that the animal shed its horns; but it does not appear to have been accepted as a fact, until an animal in confinement in the London Zoological Gardens afforded actual and visible proof of the peculiarity.

Notwithstanding its fine turn of speed, the Prongbuck is a poor jumper—the result of its prairie life, where obstacles are few and far between. In districts where the animal has not been much disturbed it is by no means a hard matter to get within gun-shot of it; but it speedily becomes shy and timid, and taxes the skill of the hunter

to the utmost. A well-known naturalist and sportsman says: 'The ostrich, with his vaunted power of vision, is comparatively near-sighted when compared to the Pronghorn. The giraffe may excel him, not from having superior eyes, but from their greater elevation, and therefore greater scope. The deer is simply nowhere in this respect. I never had any difficulty in getting within two hundred yards of an ostrich in any decent place; yet I at first found it difficult to get within six hundred yards of a Pronghorn, and then it was invariably a wideawake one, fully able to take care of himself.'

The flesh of the Pronghorn is excellent, although it bears a peculiar odour which some people consider unpleasant. Like many other North American animals, this Antelope is rapidly approaching the point of extinction, and it is now only found in the more remote Western regions.

MISCELLANEOUS ANTELOPES.

Of the remaining Antelopes can be briefly mentioned, in almost haphazard order, only a few that possess some more or less specially marked characteristic. The Saiga Antelope (*Saiga tatarica*) is the only desert Antelope which is found in Europe, chiefly on the steppes of Russia, from which the animal extends into Asia. It is about equal in size to the common goat. The nostrils of the animal are curiously inflated, giving the head a generally swollen appearance, more than matching its rather ungainly build.

The Klipspringer (*Oreotragus saltator*), Plate XXXIII. Fig. 1, prefers rocky ground, as signified in its name, which means 'rock jumper.' The animal ranges from Cape Colony through most of East Africa to Abyssinia, in which regions it traverses even precipices with wonderful activity and sureness of foot. It is an olive-coloured little animal, not exceeding two feet in height, with horns only four or five inches long, which bend forward at their tips. The skin of the legs, with the little hoof attached, is frequently used by the Kaffir belles as an anklet or bracelet.

The Kudu (*Strepsiceros kudu*) roams very much the same regions as the last-named. It somewhat resembles a

small Eland, though the horns are often much longer than in the larger animal, some specimens measuring over five feet along the curve. Captain Harris considered it to be the most majestic in its carriage of all the Antelopes. Inhabiting brushwood tracts, the immense horns would appear likely to prove a great hindrance to rapid progress ; but the animal lays its horns upon its back and dashes through the mazes of scrub growth without difficulty. Kudu skin is highly prized. No other thin, tough leather will make so good a whiplash for the long whips that are used in oxen team driving, &c.



HORNS OF THE KUDU.

The Hartebeest (*Bubalis caama*) is typical of a genus which includes animals ranging widely separated regions, all of which, with one or two exceptions, are confined to Africa, the happy hunting-ground of the Antelope family. The animal gains its name from its more than remote resemblance to a stag ; but it is also often called the Cervine Antelope. It can at once be recognised by the peculiar form of its horns, which are first curved slightly forwards and then bent suddenly backwards. Like the Blue Ox of India, the Hartebeest drops upon its knees to make use of its horns.

The common Hartebeest is a South African species that is limited to the regions south of Mashonaland. This animal is desperately tenacious of life. Even with a broken limb or a bullet through its body and penetrating a lung, it will still forge along in front of its pursuer, and not infrequently make its escape. As the habitat of the Hartebeest is only the remote desert regions, it is not very likely to die out. This applies equally to several other species, which are hunted only with the greatest difficulty, for if the Antelopes concerned can exist without drinking, the horses necessary to

engage in the chase of them must be supplied with water, or else they will die.

The Blesbok (*Bubalis albifrons*) is a smaller animal, a brilliantly coated Antelope with hair chiefly of a purple-red colour, which serves to throw up into greater prominence the white 'blaze' down the face. In the neighbourhood of the Vet River, Gordon Cumming says that he saw 'a purple mass of graceful Blesboks which extended without a break as far as the eye could strain.' It is said that the skin of this Antelope gives off a delicious odour of flowers and sweet herbs.

The Four-Horned Antelope (*Tetraceros quadricornis*) is a small Indian species, almost Hare-like in its habits. The male is distinguished by the possession of a double pair of horns. The larger pair, only about four inches in length, are placed well back on the skull; the second pair, rising immediately over the eyes, are only half as long; in some cases they are absent altogether or are reduced to mere excrescences.

The Addax (*Addax nasomaculatus*), Plate XXXIV. Fig. 2, which inhabits the barren sandy deserts of North Africa and Arabia, is a heavily and long horned animal. It is largely hunted by the Bedouins, who use horses and greyhounds in the chase.

No account of the Antelope family would be complete without reference to various pretty, graceful little animals, which have quite whippet-like bodies, supported on relatively long and slender legs. The Pigmy, or Royal, Antelope (*Neotragus pygmaeus*) of West Africa is less than a foot in height. Only the males have horns, which are nearly straight, and either vertical or inclining backwards.

The Dik-Dik Antelopes are almost as small as the foregoing, but they possess at least two distinctive features. Their noses are elongated and hairy, and there is usually a tuft of hair on the crown of the head. There are half a dozen different species in the north-east of Africa, of which Phillips's Dik-Dik (*Madoqua phillipsi*), Plate XXXIV. Fig. 1, serves as an excellent example. The photograph is one-sixth of the natural size of this tiny Antelope, which is most popular with visitors to the Zoological Gardens.



1. KLIPSPRINGER.

(See page 334)

2. BEATRIX ANTELOPE.

(See page 328)

(Photo Autotype Company.)

(Photo W. S. Berridge, F.Z.S.)



1. DIK-DIK ANTELOPE. 2. ADDAX ANTELOPE.

(See page 336)

(Photo W. S. Berridge, F.Z.S.)

FAMILY CAMELOPARDALIDÆ (GIRAFFES).

GIRAFFE (*Giraffa camelopardalis*).

Coloured Plate XXIII.

The Giraffes are a most singular group of African ruminants, which appear to occupy a place between the Hollow-horned Ruminants and the Deer. A noted Swiss naturalist, in fact, described the animals as 'a most fantastic form of Deer.' The family name arises from their form and coloured spots suggesting some resemblance to the camel and leopard respectively. One writer says that 'a careful study of its features will discover in the Giraffe a likeness to the camel, the ox, the deer, the antelope, the goat, and the ostrich.' The name Giraffe is a corruption of the Arabic *Zaraffa* (or Seraph), the literal meaning of which is 'graceful.'

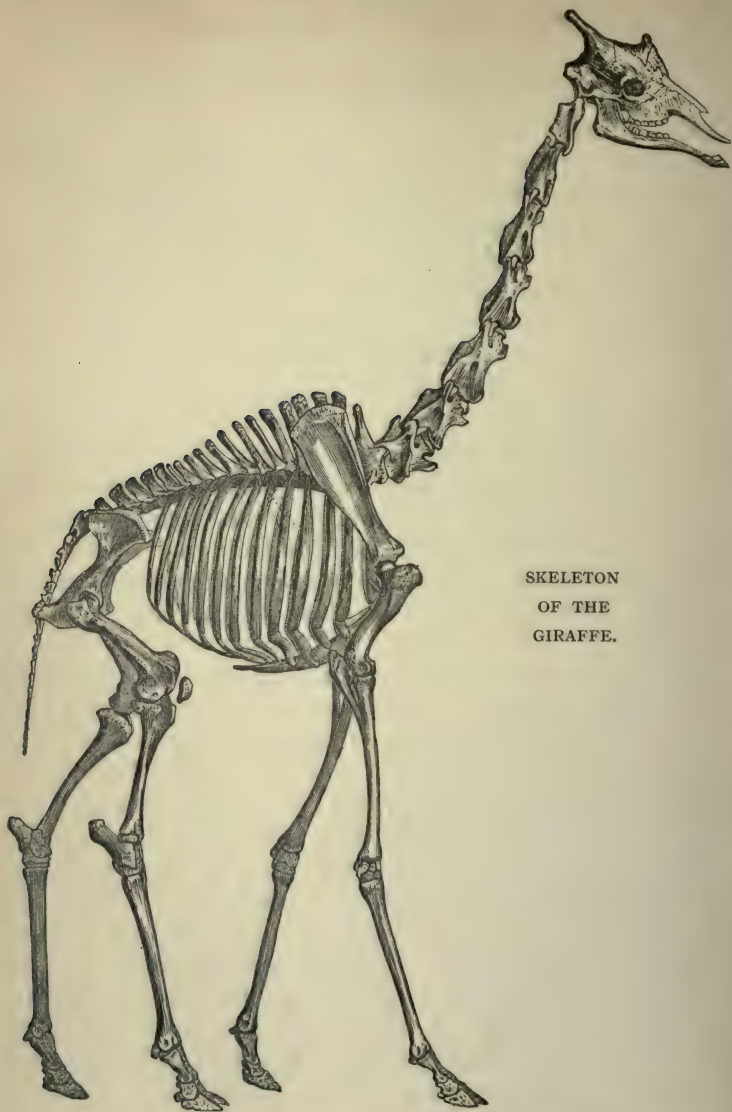
There are at least two species of the Giraffes. The Southern or Cape species ranges from Bechuanaland to British East Africa and the Soudan; the Nubian or Northern species is found in the Somaliland region and between Abyssinia and the Nile. There are quite ten varieties.

The Giraffe is the tallest of all known mammals, the males attaining a height of as much as nineteen or twenty feet, while the females range from thirteen to sixteen feet. The short, deep body is raised on slender, elongated limbs, the greater elevation of the withers giving the fore legs the appearance of much greater length than the hind ones, a difference that is decidedly more apparent than real. On the chest and knees are pads of thick, hard skin to protect the animal from abrasions when resting upon rough ground.

The head, splendidly poised at the extremity of the long, tapering neck, is elegantly moulded and ends in a singularly narrow muzzle with a well-formed mouth. The upper lip is long and prehensile. The eyes, soft and gentle in expression, are large and prominent, affording a specially wide outlook on every side. The ears are large and pointed, and the large nostril slits can be closed at will.

The head of the Giraffe, in both sexes, is furnished with

so-called horns, which in the young animals are not con-



SKELETON
OF THE
GIRAFFE.

nected with the bones of the skull, gradually becoming fixed as the animal increases in age. The Giraffe of South Africa



Giraffe

has two horns, but in the northern species there is usually a third horn in the centre of the forehead. These bony processes are unlike the horns of any other animal, being mere knobs or protuberances that might well be the bases from which true horns might be expected to spring. Neither velvet nor hollow horns ever appear upon them, but a tuft of black hair adorns their tips.

Notwithstanding the great length of the neck, it consists of but seven vertebrae, in which it agrees with what is practically a law among mammals. It naturally follows that each vertebra is very long, which makes the neck not nearly so flexible as its tapering shape would suggest. Its length allows the animal to browse on the leaves of trees, especially the acacia, which it prefers before all others. To match the mobile upper lip the tongue is exceedingly long, slender, and flexible, so that the animal can twist it round the leaves, and thus draw them into its mouth.

This structure of the tongue can be seen to advantage by placing a lump of sugar on the ground before a Giraffe. The creature cannot bend its neck, but can only stoop it from the shoulders in a straight line. By dint of much straddling with the legs it gets its nose near the ground, and then, by protruding the tongue and coiling its tip round the sugar, it succeeds in gaining the coveted dainty. In the arid regions which it inhabits the Giraffe will find no opportunity of touching water for several months at a time, and hence the opinion of Bushmen and earlier travellers that the animal never drinks at all. Upon this point Mr. Selous may be quoted. He states that upon one occasion, a little before sundown, he was 'just in time to see three tall, graceful Giraffes issue from the forest a little distance beyond on their way down to the water. It is a curious sight to watch these long-legged animals drinking. Though their necks are long, they are not sufficiently so to enable them to reach the water without straddling their legs wide apart, this position having to be assumed, not only when drinking, but likewise when the animal desires to pick up a leaf from the ground, or on the rare occasions when it grazes' (Plate XXXV. Fig. 1).

The hair of the Giraffe is short and close, the ground colour in the South African species being a creamy fawn, marked freely with irregular patches varying from lemon-fawn to brownish black. The Nubian Giraffe is chiefly a light reddish chestnut, covered with a fine network of tawny lines almost geometrical in design. From the nape of the neck to the withers is a short and erect mane; the tail is furnished with a long black tuft at its tip.

'The Giraffe during flight,' says Andersonn, 'does not move the limbs of either side alternately, but swings forward the two legs of the same side at the same instant, so that it is one of the most curious sights imaginable to see a troop of these animals at full speed, balancing themselves to and fro, while their long and tapering necks, swaying backwards and forwards, follow the motion of their bodies.'

The sweeping, rocking stride of the Giraffe seems to take it over the ground with very little exertion; it appears to sail or glide along almost without any movement of the legs at all. For the first two miles horses are quite unable to cope with it, and if the Giraffe can reach mountainous or rocky country they are still further out of the question. Though the hoofs are like those of gigantic cattle, they are quite goat-like in the ease and certainty with which ravines are cleared. Like the horse, the Giraffe can use its hind-feet very effectively, and it is said can kill a lion with a single kick. Hunters give a dying animal a wide berth, for there is 'little to choose between a kick from it and a blow from the arm of a windmill.'

Like many other animals that minister to man's necessities, and his still more numerous desires, the Giraffe is often stated to be within sight of extermination. The increasing settlement of South Africa has driven the last remnants of the once numerous herds into the more remote regions of the Kalahari desert. It is doubtful if in any part of the continent will ever again be seen a herd of a hundred and fifty Giraffes, such as Sir Samuel Baker reports that he encountered; but nevertheless the animal is yet more than fairly common in the remote wilds to which it has retreated.

The flesh of the Giraffe is excellent, and that of the young is an especial delicacy; but it is for its hide, an inch in thickness, and fetching from £3 to £5, that it has been hunted so mercilessly. He, however, who would now seek for it must leave the haunts of man and penetrate pathless wilds, wide and arid wastes, where the lion prowls and the hyæna and the wild dog hunt their prey. Here man is the enemy least to be feared; but the Giraffe often falls before the lion, though not without resistance. Rendered desperate by necessity, it uses its hoofs as weapons, and oftener still will it bear away its ferocious antagonist clinging on, with teeth and talons, before sinking prostrate in death. Even when happy and active the Giraffe is strangely mute, and not even in its death-agonies does it give vent to the slightest sound.

OKAPI (*Okapi johnstoni*).

Plate XXXIX. Fig. 1.

Little is known of the Okapi, which white man had never seen, alive or dead, until the twentieth century. When H. M. Stanley journeyed through the great fermenting vat of Central Africa in his task to relieve Emin Pasha, his most interesting discovery was the existence of a hitherto unknown pigmy people in the great Semliki forest between Uganda and the Congo Free State.

The great explorer maintained that the Semliki region contained animals that were yet strangers to the naturalist, and in addition to some new animals that he had seen, the dwarfs had told him of an animal like an ass which they captured in pits. Unfortunately the performance of Stanley's main purpose, and the straits to which he and his companions were reduced, allowed little or no time for natural history investigations; and it fell to the lot of Sir Harry Johnston to put the explorer's statement to the proof some eleven years later, when he undertook to escort home a party of pigmies whom the authorities had prevented being taken to Europe for exhibition purposes.

When Sir Harry Johnston questioned the dwarfs con-

cerning the animal, they gave him to understand that the creature was like a mule with a zebra's skin. Arriving at a European station, the Belgian officers admitted that they had seen some such animal, but only when dead, after it had been brought in by natives; more than that, some of the native troops were wearing strips of the animal's skin as bandoliers. Some of these pieces of skin were presented to Sir Harry Johnston, who promptly assumed that the animal must be some species of horse, which was also the opinion of leading naturalists at home to whom the specimens of skin were sent. A little later Sir Harry revised his opinion, for though he could not get a glimpse of an animal the natives were able to show him its tracks, and the marks were not unlike those of the eland.

Eventually were procured a couple of skulls and a complete skin, which was set up and exhibited in the Natural History Museum, South Kensington, and it remains one of the very few specimens yet in existence in any collection. The stuffed skin shows an extraordinary beast, suggesting a link between the giraffe and the antelope. Though evidently an immature animal, it stands five feet high at the shoulder, and there is little doubt that the full-grown Okapi is six, or even seven, feet in height. The body is a rich, glossy purplish brown in colour, the legs, hind-quarters, and sides of the head being white, while there are black bands on the thighs, with a perpendicular black band running down the front of the leg to join another broad band of black above the hoof, which has two toes like those of the giraffe. The legs are clean and slender and the hoofs neat, with every indication that the creature is of great speed. The adult male has two short curved bare horns just above the eyes, which again appear to mark the Okapi as a cousin to the giraffe.

SOLID-HORNED RUMINANTS.

FAMILY CERVIDÆ (DEER).

The family Cervidæ consists of at least a score of species and a far greater number of varieties, including a multitude of antelope-like creatures, many of them of graceful form,



1 GIRAFFE.
(See page 339)

2. SWAMP DEER.
(See page 363)

(Photos W. S. Berridge, F.Z.S.)



ANTLERS OF THE RED DEER: 1. IN VELVET. 2. ROYAL HART.

elastic step, and animated expression. Unlike the antelopes, the Deer are never found in desert regions : they are chiefly inhabitants of grass jungles and forests. They are very widely distributed, being found in Europe, Asia, and America ; in Africa they are restricted to the North, and in America the species are fewer than in the Old World.

Some of the Deer are among the noblest animals on earth ; their limbs are slender, strong, and sinewy, usually fitted with well-developed lateral hoofs ; their necks are tapering and swanlike ; their heads are held high, and the males are almost invariably garnished with antlers. There is considerable variety of colouring in the coats of Deer, different shades of brown predominating. With the exception of a very few species, the Elk, Reindeer, and Sambar among them, nearly all young Deer have their coats spotted with white, or else horizontal stripes of the same colour. In a few cases these markings remain as a permanent adornment, and in others the variation reappears only at more or less regular periods.

In very many particulars the Deer follow pretty closely the Hollow-horned Ruminants, but on account of their antlers the males of the former, at least, are easily distinguished from the other Ruminants, the single exception being provided by the female Reindeer, which is antlered like the male animal.

Antlers differ widely from horns in their composition, consisting of genuine bone, solid throughout, generally more or less branched, and cast every year.

The production, loss, and renewal of the antlers of the Deer are among the most remarkable wonders of animal physiology. Upon the young animal's skull, covered by nearly smooth dark skin, are two slight protuberances, the foundations whence future antlers are to arise. In spring the skin around the knobs upon the forehead becomes hot and swollen, owing to a large quantity of blood being directed to the spot. The arteries and veins of the skin become greatly enlarged and deposit bony matter on the skull with great rapidity. The young antler, still enveloped in skin, which is called the 'velvet,' grows quickly, the arteries and veins following its course (Plate XXXVI.).

When the antler has attained its full year's growth, it would be useless if surrounded by the sensitive velvet, which would bleed harmfully if wounded. At the base of each antler there is a circular ridge or burr. As the burr is formed it narrows the grooves in which the arteries lie and gradually cuts off the supply of blood. The skin, thus deprived of the life-giving fluid, shrivels and dries up, when the Deer gets rid of it by rubbing the antlers against tree-trunks. While in velvet the animal is very inoffensive, taking the greatest care of its headgear.

So much for the growth of the antlers, but now for the reason of their annual renewal. The Deer live in small families, each family consisting of several females and one male. In order to ensure that the offspring shall be strong and healthy, the males always have to fight for their wives, the latter cheerfully becoming the property of the victor. Often in combat an antler is broken, and if there were no means of repairing the loss, the animal would be permanently disabled and unable to fight, just when he was at his best. The rapidity with which so large an amount of bony matter is deposited is really wonderful. The antlers of the Wapiti, for example, weigh as much as sixty pounds. They begin to grow in February, and are complete in September. How the head and neck become accustomed to the great weight is rather mysterious. Especially is this the case with the Moose, whose broad antlers are of enormous proportional weight; and in the great Irish Elk now extinct, they weighed more than the whole skeleton.

Deer feed chiefly on the leaves of young trees and shrubs, grasses, weeds, and fungi of various kinds. In autumn fallen fruits, nuts, acorns, &c., afford the animals almost unlimited provender. Deer flesh, or venison, both of wild and domesticated animals, is wholesome and nutritious. Deer skin can be dressed as soft as that of the chamois; and the excellence of doe-skin gloves is too well known to need special description.

Considering their usefulness, it is remarkable that civilised man has not domesticated the Deer tribe more largely. It has been left to the Laplander to show by means of the Reindeer how largely Deer of many kinds might minister

to man's appetite and comfort. From the very earliest times Deer were viewed chiefly through the eyes of the sportsman, and stringent game laws prevented the commoner people taking any practical interest in them.

In Britain there are comparatively few Deer; the Red and the Roe Deer are found wild in Scotland and a few other districts; and semi-domesticated Fallow Deer adorn many parks up and down the country. Upon various estates are small herds of imported foreign species that easily become acclimatised, and thrive so well as to make it a matter of regret that so little has been done in this direction. In the royal forests, and on the estates of the princes and rich feudal lords of Germany, Austria, and Russia are great herds of Red, Fallow, and other species. In some of the great hunting-parties organised by the Kaiser it is no uncommon thing for two hundred head of Deer to mark the result of a single day's sport.

Deer may be classified according to their tail, feet, or antlers. The best known species easily fall into the following:—

Short-tailed Deer.—Red Deer, Wapiti, Elk, Reindeer, Sambar, Swamp Deer, Schomburgk's Deer, Roe Deer, Virginian Deer, and Chinese Elaphure.

Long-tailed Deer.—Fallow Deer, Manchurian and Japanese Deer, Hog Deer, and Axis Deer.

Of the many species of Deer can be selected but a few of the most typical representatives, but the particulars concerning them will include the chief interesting facts connected with the life-history of most of this large assemblage of species. For convenience' sake we take them more or less in regional groups, rather than follow in strictly scientific order.

RED DEER (*Cervus elaphus*).

Coloured Plate XXIV. Fig. 1.

Before cultivation had extended so thoroughly over Great Britain the Red Deer abounded in great numbers. It was protected by the severest laws; deer-stealers were accounted

criminals of the deepest dye ; but men in defiance of laws and edicts 'bent their bows and lived upon the chase,' and such as Robin Hood and William of Cloudesley were accounted as national heroes, whose names have been handed down to posterity in many a stirring ballad.

The Red Deer belongs to the Elaphine group, which contains the grandest and most typical species of the whole family. It still exists in a wild state in Exmoor Forest ; in Scotland north of the Firths of Forth and Clyde, and in various of the western islands ; and in Kerry and Connemara in Ireland. It abounds in South Germany, Austria, Poland, and the Danubian States. It is not only scarcer in Scandinavia, but is a smaller animal. It is also found in the Caucasus, Asia Minor, and the temperate regions of Siberia, where it attains a greater size than in Europe. The Barbary Deer is but the African variety of the Red species. Thanks to the Prince Consort, the Red Deer was introduced into New Zealand for purposes of sport with excellent results, for it there exceeds in size any of the Deer of the British Islands.

A well-grown stag stands quite four feet high at the withers, the hind being four or five inches less. Its body-colour is a rich red-brown, the neck more thickly coated and inclining to a greyish tint ; and there is a yellowish-white patch on the buttocks. In winter the covering is longer and greyer. A stag in its short shiny coat, and carrying a pair of well-curved symmetrical antlers, is in summer the lordliest of our native animals.

A description of the various stages in the growth of the antlers of the Red Deer will apply more or less to all the Cervine family. The fawn or calf is usually born early in June, and the young male animal or 'Knobber,' as it is called, puts forth its first simple antlers in the following spring. They are straight, conical, and unbranched, and the young Deer's name is changed to that of 'Brocket.' About the end of February in the following year the Brocket sheds its antlers. The new antler rapidly makes its appearance, and is found to have received an addition in the shape of a brow tine, while the beam itself remains as last year, except that it is larger and stronger. The two-year-old hart is



1. Red Deer



2. Muntjac



3. Roe Deer

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now known as a 'Spayad.' The next year the beam throws out an extra front branch called the 'tres' tine; and in the fourth year the 'bez' tine appears just above the brow tine, and at the same time the top of the main beam bifurcates into the 'sur-royals.' The four-year-old male is called a 'Staggard.' In succeeding years the whole antler of the 'Stag' is not only larger, but the sur-royals increase, breaking out in a series of snags forming something like a cup, until is reached the full adult, a 'Royal Hart,' with antlers three feet long, weighing as much as seventy pounds, and possessing from a dozen to forty points (Plate XXXVI.)

In Scotland a stag with the latter number would be accounted a specially fine animal, but in Central Europe are found magnificent harts with as many as sixty-six points, and quite doubling in weight the twenty to thirty stone of the finest Scotch stags, such as are found in the woodlands of Perthshire. The great animals of Southern Germany and Austria belong to the estates of the monarchs and rich feudal lords, and the Deer raid the growing crops of the agriculturist with more freedom than would be permitted in Britain, and are thus fed up into splendid specimens of their tribe.

Phosphate of lime is the chief ingredient in the Deer's antler. Just as with our domestic poultry it is necessary for them to eat in some form the lime which strengthens the shell of the egg, so the Deer, if it be meant to produce a good pair of antlers, must have access to some source whence lime can be obtained. If hens cannot obtain the necessary mineral substance they will eat even their own eggs, and so, after the antlers have been shed, the male Deer commences to eat them. That a Deer with its little mouth, feeble jaws, graminivorous teeth, and ruminating stomach, should attempt to eat shed bone, which would try even the jaws and teeth of a hyæna, seems sufficiently absurd. But, nevertheless, the Deer does contrive, by patient gnawing, to assimilate every particle of a shed antler, in the absence of which it will take to a bone, and treat it in the same way. Thus we can account for the fact that, even in districts where the Deer tribe abound, it is seldom the case that a stray antler can be found after the lapse of a few weeks.

The Red Deer is gregarious, but the males and females keep apart except during the pairing season, which commences about the end of September, when the herds break up into a number of families, each consisting of several females and one male. At this period the harts become dangerous, which is one of the reasons why Red Deer are seldom chosen to roam in a semi-domesticated state in parks and other places frequented by foot passengers. Even in captivity the hart can seldom be approached with safety. In the forests and uplands the males engage in savage conflicts, antlers are frequently broken, and sometimes they get interlocked, and can only be released by a forester.

The hind usually conceals her fawn in the heather, where the little creature will lie motionless until one nearly steps upon it. Though the mother is apparently absent, she is within sight of her offspring, and will rush to guard it against a wild cat, fox, or other hungry carnivore.

In Scotland the Red Deer is killed chiefly by driving or stalking; but with rifles of long range and the utmost precision the chase is not so arduous as it was in olden times. Being a capital swimmer, a stag, when hard pressed, will take to either lake or stream in the hope of defeating the pursuing hounds, which are chiefly used in the chase in Devonshire. It is a stirring sight to see a stag at bay upon a rock in the midst of the water, making angry sweeps with his antlers that bid a whole pack give pause, until, alas! the fatal rifle-shot puts an end to the gallant struggle.

In Devonshire no less than two hundred and seventy-five Deer were killed in the five years ending 1892; but since that time the numbers of the Deer increased to such an extent as to cause an outcry on the part of the farmers, whose crops suffered from the ravages of the roaming herds. In 1905 as many as three hundred and seventy Deer were killed by the five packs of hounds that hunt the Exmoor and adjacent districts, which did something towards reducing the numbers of the Deer to reasonable proportions.

Let it be granted that there may be two opinions con-

cerning the cruelty inseparably attached to hunting the wild Red Deer for purposes of sport. But there can be no palliation of the brutal practice as followed in some of the southern counties, where the quarry consists of a frightened and only half-wild animal, turned out of a box just previously to the commencement of the hunt. Very often, too, when the animal has been run down, it is rescued from the hounds only to provide sport upon another occasion.

FALLOW DEER (*Cervus dama*).

Coloured Plate XXV. Fig. 3.

The familiar Fallow Deer, which is so ornamental an inhabitant of many parks and pleasure-grounds, easily accommodates itself to domesticated ways, and becomes much more tame than the generality of sheep. At the time of year, however, when the males are doing battle for their partners, they consider any living creature as a rival, and attack it furiously. It is as well to keep out of their way until they have settled all their households, as even the keeper who feeds them becomes an object of suspicion.

The Fallow Deer is said to have been introduced into Britain by the Romans. It probably died out in later times, and James I. is sometimes credited with having reintroduced it from Norway. In all probability the original habitat of this species of Deer was the shores of the Mediterranean, but in any case Fallow Deer existed in Windsor Park quite one and a quarter centuries before James came to the throne.

Smaller and more slender than the Red Deer, a full-grown fallow buck rarely exceeds three feet in height at the withers. Its head is short and broad, and it has a tail six or seven inches long. In both sexes the colour of the coat in summer is fawn or yellowish-brown, marked all over above with large white spots. In winter the spots nearly completely disappear, and the colour becomes more sombre, taking on a greyish tint. The Fallow

Deer of Epping Forest are not spotted, and, singularly enough, the fawns are of the same dark brown colour as their parents.

A special feature of the antlers is the manner in which the upper portions flatten or palmate—*i.e.*, they take on the shape of a hand (Lat., *palma*, a palm). Twenty to twenty-seven inches is a good length of antler, and there is no record of one as long as thirty inches. The male up to its sixth year takes a fresh name each season with the annual change in its spreading crest. A fawn is antlerless. The 'Pricket' possesses simple snags, to which the 'Sorrel' adds two front branches a year later. In the next season the increasing antler shows a slight amount of palmation, the animal becoming a 'Buck of the first lead' in its fifth year, and a Buck complete in its sixth. A well-grown animal will turn the scale at two hundred pounds.

The Fallow Deer has to be supplied with hay and corn in winter, owing to living in enclosed tracts where its natural food is limited and soon exhausted. It is particularly fond of horse-chestnuts, for which reason this tree is largely planted in deer parks.

On February 8, 1899, a pack of hounds chased a Red Hind into Pixton Park, where they ran it down and killed. The dogs then fell upon a herd of tame Fallow Deer, of which they killed seventeen before the huntsmen could come up to stop the slaughter.

The extinct Irish Elk is supposed to have been only a species of the common Fallow Deer. In County Waterford has been dug up a pair of antlers, the right one of which measured six feet on the inside, while the left one was four inches shorter. From tip to tip the spread just exceeded nine feet. The chase of an animal so immense must have furnished rare excitement, when one remembers the clumsy weapons with which primitive man was provided. The Irish Elk roamed over Great Britain as well as over a great portion of the Continent.

The Fallow Deer of Mesopotamia is not only a larger animal, but is more brightly coloured, and there is less palmation of the antlers, which are more vertical and spreading.

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1. Musk
Deer



2. Kanchil



3. Fallow
Deer



ROE DEER (*Capreolus caprea*)

Coloured Plate XXIV. Fig. 3.

This elegant and active Deer is the smallest of the European species, even an adult buck being little more than two feet high at the shoulder, and weighing only about sixty pounds. The Roe Deer is a native of the British Isles, but is also found in many parts of Europe between the Baltic Sea and almost as far South as Spain and Italy; and from the Caucasus it extends into Persia. In Asia it is of larger size than elsewhere. In Britain the Roe Deer is now found in a wild state only in the Highlands of Scotland, except for a few scattered herds in Blackmoor Vale, Dorset, and Epping Forest. In many English parks are herds of semi-domesticated animals.

In summer the coarse and stiff hair of the Roe Deer is a dark reddish-brown, with a white haunch patch; in winter the colour is grey with a tinge of yellow. Normally, the nine-inch-long antler possesses but three points, each taking a year to grow; but not infrequently there are a number of other ill-formed and irregular tines. While in the stag the antlers are shed early in spring and renewed with the advance of summer, those of the Roe Deer are shed by the end of December and renewed by the following February. No antler has been found to exceed thirteen inches in length; but it has been known to prove a sufficient weapon to kill a man. Sometimes there is a third antler in the middle, and at rare intervals a hind is found in possession of antlers.

Wild, shy, and cautious, the Roe Deer generally frequents woods, where it lives in small companies of a pair and their young, which often number two at a birth, though three is by no means a rarity. The spots on the coat of the fawn fade away towards the end of its first year. In



BONES OF
FORE FOOT OF
THE ROE DEER.

one particular at least the Roebuck is unlike others of his kind; he never forsakes his mate.

When hunted, this Deer is said to endeavour to elude its pursuers by the most subtle artifices: it repeatedly returns upon its former steps till, by various windings, it has quite confounded the scent. The cunning animal then, by a sudden spring, bounds to one side, and, lying close down, permits hounds to pass quite near without offering to stir.

The Roe Deer can never be perfectly tamed. Even in captivity it retains most of its natural wildness, refusing even to become friendly with the one at whose hand it feeds. In hunting the Roe Deer in Scotland the animals are frequently driven to the guns, which are often loaded with shot instead of ball cartridge. One notable day's bag in Inverness-shire consisted of sixty-five bucks and thirteen hinds. On the Continent this species of Deer is still more abundant, and in Austria over sixty-eight thousand have fallen to the hunters in a single year.

ELK (*Alces machlis*).

Coloured Plate XXVI. Fig. 1.

The Elk or Moose, huge and ungainly, is the giant of the Deer tribe, attaining a height of from six to nearly eight feet, and weighing as much as fourteen hundred pounds. Fossil remains prove that the animal existed in the British Isles some ten thousand years ago. It now inhabits the extreme North of Europe and the cold regions of Asia and North America, being commonest in the last-named. There are only a few strictly preserved animals in the north of Scandinavia and various parts of European Russia; in Siberia it is more numerous. In the middle of the last century this great Deer was common throughout the north of the New World, but reckless hunting for the sake of its hide has greatly diminished its numbers. Labrador and the basin of the Lower Mackenzie are now the chief hunting-grounds, and there the Government restricts the slaughter, and only permits fair sporting methods of capture.

The Elk is remarkable for its huge, broadly palmated, shovel-shaped antlers, the upper portions forming concave sheets of bony tissue, roughly measuring forty inches in length and half as much in width. They attain their full length, varying from three to five feet, in about five years, after which they increase in breadth and weight until the animal is ten or more years old. The coat of the animal consists of harsh, brittle, close-set hair, in colour a dark reddish-brown, varying to yellowish grey; and in winter there is a plentiful under-fur. The neck is covered with longer hair, forming a ruff underneath.

It is the manner in which the Elk carries its short, thick neck, outstretched at a lower angle than the withers, that gives the animal its awkward appearance, which the greater length of the fore legs does nothing to lessen. The upper lip is rather singularly developed, forming a great muffle, as it is called. This mobile extension is particularly useful in browsing upon the leaves of trees, which the Elk prefers to grazing. The muffle, when cooked, is considered to be the best part of the animal.

While running, the Elk makes a singular clattering sound at each step. This is caused by the structure of its hoofs, which are so modified that when the foot rests with its weight upon the ground, the hoofs separate widely, so as to present a large surface on which so heavy an animal can be borne. As it raises its foot from the ground the two halves of the hoof fall together and so cause the characteristic clatter, which has been compared to the sound of castanets.

In habit the Moose is generally an almost solitary animal; it is seldom that more than one at a time is seen except in the pairing season, or when the female is still accompanied by her young. Upon rare occasions a bull will remain with the old and young females. Wary in the extreme, and ready to detect the presence of man by hearing, scent, or



UNDER VIEW OF ELK'S
HOOF.

sight, the Moose does not yield itself an easy prey, but taxes the resources of the hunter to the utmost. If, for example, a hunter should come within a mile of a Moose, and allow the wind to blow from him to the Deer, the animal will scent him at once and make off with immense strides, greatly accelerating its usual high shambling trot. Trappers and hunters assert that even amid the most furious tempest, the snapping of a twig by human hand or foot will be detected by the cautious and suspicious animal, causing it to be additionally watchful for hours afterwards.

There is, in fact, only one part of the year in which the Moose can be hunted openly. When the snow is deep, and a sharp frost has covered it with a thin crust, the Moose-hunter rejoices. He puts on his snow-shoes, and by their aid skims lightly over the frozen surface. He then boldly gives chase to the Moose, which, by reason of its great weight, breaks through the ice-crust and sinks beyond its knees at every step. By driving the animal incessantly through this treacherous snow, the hunter tires it so effectually that when he comes up with it the Moose has no strength left wherewith to resist. But even at such a time it is necessary for the hunter to exercise caution, for if he approach too near, the animal will turn upon its pursuer, leap upon him, and trample him underfoot.

On firm ground the Moose is a most formidable antagonist, using not only its horns but its feet with terrible effect. In face of an injured and infuriated animal a hunter will sometimes shelter himself behind a tree, and in its efforts to reach its foe the enraged Moose will completely strip the bark from the trunk by striking vicious blows with its forefeet.

The wily Red Indian stalks the Moose with marvellous skill. Selecting a place of concealment, upon a birch-bark pipe he gives the call of the cow Moose with a fidelity that completely deceives the bull. With a bellow of defiance to all other males, the bull comes crashing through the forest, and all unsuspectingly offers itself as a fair mark to the artful red man, who reaps the reward of his ruse.

1. Elk



2. Reindeer



TO THE
MEMBERS OF THE

REINDEER (*Rangifer tarandus*).

Coloured Plate XXVI. Fig. 2.

Just as the Prong-horned Antelope affords an exception to the otherwise universal rule that the hollow-horned ruminants do not shed their horns, so the Reindeer is an exception to the rule that in the solid-horned ruminants the antlers belong only to the male. In the Reindeer both sexes have antlers, though those of the male, often nearly five feet in length, are quite unlike those of the female. In both cases the antlers originate further behind the eyes than in most of the Deer tribe. In the males are particularly noticeable the brow tines, which are palmated in a special degree well over the animal's face. This share-like expansion, larger in one tine than the other, forms a useful tool with which to burrow in the snow in search of lichens, mosses, &c. The antlers of the female are smaller, slenderer, and with less palmation. Really, Reindeer antlers are seldom exactly alike in any two animals, and often in the same animal the two antlers differ widely from each other.

The Reindeer is found in the Arctic regions of Europe, Asia, and America, and though it differs considerably in size in different regions, there is a consensus of opinion that there is really but one species. In America, the Caribou, as the Reindeer is called, is smaller in the barren lands of the North than it is in the more southern woodland region. In Europe, as late as the sixteenth century, the Reindeer existed in Poland; in the time of Julius Cæsar it was found in the Black Forest, and in still earlier periods as far South as the Pyrenees. Nowadays it does not extend further South than the northern shore of the Baltic Sea.

The Reindeer possesses a characteristic Deer-like form, with a stout heavy neck and short limbs, the whole build denoting considerable power. The feet are marked by the wide cleft and the well-developed lateral hoofs, as in the elk. An American buck of the larger variety stands about four and a half feet high at the withers, and an exceptionally fine animal will weigh four hundred pounds. Dark brown,

tending to grey, is the prevailing colour ; the face, neck, and throat are whitish, and there is a white band round each fetlock. There is, however, considerable variation in tint in individuals, and in winter the almost crimped and wavy hair is always lighter, in some cases nearly white. The under-coat of woolly fur renders the skin especially valuable for clothing and other coverings in the Arctic regions.

Concerning the habits of the wild Reindeer comparatively little is accurately known. Baron Nordenskiöld closely observed it in Spitzbergen, in which desolate region herds of Reindeer are very numerous. Owing to the nature of its habitat the Reindeer is of necessity a migrant. In the short summer the animal seeks the ice-free grassy valleys, withdrawing in the autumn to the sea-coast, where its food is chiefly seaweed. In winter it retires to the high lands in the interior, where it can find a living on the lichens and mosses. In America the northern variety migrates southwards in winter to the woodland regions ; in spring a plague of gnats and gadflies drives the animals back to the colder uplands.

Of the various animals which man has domesticated, some, as the ox, sheep, horse, and the dog, have spread over the globe, and, particularly in company with the white man, prosper and thrive thousands of miles away from their original habitat. Others again, of undoubted utility, remain bound to certain latitudes, isolated regions, where, with a nature accordingly adapted, their services are invaluable—thus are the camel for the arid deserts of the East, the llama for the snow-clad Cordilleras, and the Reindeer for the hills and plains of Lapland.

Various tribes of Indians would be unable to exist in the Arctic portions of British North America were it not for the immense herds of Caribou. Of the antlers they form fish spears and hooks, and, previous to the introduction of European iron, ice-chisels and various other tools were likewise made of them. From the hide is made soft and pliable leather, and when sixty or seventy skins are sewed together, they make a tent sufficient for the residence of a large family. The shin-bone of the Deer, split so as to

present a sharp edge, is the knife that is used to remove the hair in the process of making the leather.

The undressed hide is cut into thongs of varying thickness, which are twisted into deer-snares, bow-strings, net lines, and, in fact, supply all the purposes of rope ; the finer thongs are used in the manufacture of fishing-nets, or in working snow-shoes, while the tendons of the dorsal muscles are split into fine and excellent sewing thread. Nor is the Reindeer less useful as food, but the Indians never attempted its domestication, regarding it solely as a beast of the chase.

In Northern Asia the Reindeer is used as a beast of burden, but it is in Lapland that the value of the animal is most appreciated. On the Reindeer the Laplanders depend almost wholly for their means of life. It is too valuable for them to feed largely upon its flesh, but they make much use of its milk, and, besides, it is beyond all price as a beast of transport, either as carrying burdens or as drawing the sledge.

Among the Laps, the Reindeer is the only wealth, and is to them what cattle are to the Kaffir tribes of South Africa. Happy the man who possesses a herd of a thousand Reindeer, as he thereby becomes a chief among his fellows, very much as was the case in the old patriarchal times, with the herds of camels and oxen and flocks of sheep. As Reindeer do not thrive except in company, those who possess only a few unite them into one herd, each marking his own animals. A herd of five hundred antlered Reindeer collected together at milking-time must present a striking sight, in full accordance with the wild, romantic scenery; nor can it fail to bring to mind scenes of a similar character in the days when the patriarchs were shepherds, and Kings were called from the fold.

But for the Reindeer the Laplander would be cut off from communication with other peoples during a great part of the year. The sledge is a light vehicle, running not on wheels, but on flat runners. The Reindeer is yoked to it by a collar, and guided by reins attached to its antlers ; and with a load of several hundred pounds the animal will trot over the glazed snow at the rate of ten miles an hour, a

journey of a hundred and fifty miles in nineteen hours being by no means uncommon. At the palace of Drottningholm, in Sweden, is a portrait of a Reindeer which, upon an occasion of great emergency, drew an officer with important despatches the incredible distance of eight hundred miles in forty-eight hours.

The Lapland Reindeer is a smaller animal than that of America, the male averaging only about four feet in height. Attempts have been made to naturalise this Deer in the British Isles. Herds have been placed among the mountains of Scotland and Ireland, as well as in parks and heaths in England; but every experiment has failed, the animals sickening and dying in comparatively very short periods.

WAPITI (*Cervus canadensis*).

Plate XXXVII.

The Wapiti is the Red Deer of the New World, where at one time it ranged from Mexico as far North as the Great Slave Lake. With the advance of civilisation this noble Deer has retreated, until in greatly decreased numbers it is now found chiefly only in the Cascade and Rocky ranges and adjacent coast elevations, the mountains of Vancouver Island, and in the forested regions of the North-west territories of British North America.

The Wapiti, or Elk, as hunters often erroneously call it, is a considerably bigger animal than the British Red Deer, to which it is closely related. Only the moose exceeds it in size, a fine male standing from five to five and a half feet high, with antlers measuring as much as five feet in length, the brown beams with white burnished tips completing a superb head, perhaps second to none in the animal world. Even in captivity in the Zoo the antlers of the Wapiti weigh about forty pounds.

The neck of the animal is strong; the limbs clean and finely knit; and the whole figure displays great power and vigour. The coat differs from that of the Red Deer, being creamy grey for the most part, darkening into brown on the head and neck. The legs are brown,



HEAD OF A WAPITI.



1. SAMBUR. 2. AXIS DEER.

(See page 362)

(Photos W. S. Berridge, F.Z.S.)

and the white patch on the hindquarters is edged with black.

A fight between two male Wapitis is one of the sternest struggles imaginable. When an animal intends to dispute the supremacy of the leader of a herd he gives vent to a loud whistle of defiance, which is promptly answered by a similar cry of the angry leader, and the animals meet with a clash of the antlers that can be heard for a considerable distance. Bellowing and grinding their teeth, with lowered heads they stalk round each other, advancing, retreating, and feinting until there is an opening for a charge. Even in the mildest contest ugly wounds are given and antlers are frequently broken. Sometimes, too, the antlers of the enraged animals interlock, and both combatants perish miserably of hunger, or become the easy prey of the bear, coyote, or other beast of prey.

The hind in defence of her fawn exhibits the utmost courage, offering a stout resistance to hungry carnivores, while she utters a loud cry which summons to her assistance all of the herd in the near vicinity, and then all join furiously in beating off the foe. The young fawn, when discovered in the thicket where the hind has hidden it, will feign death with limbs as limp as possible, only forgetting to close its eyes to complete the illusion.

The flesh of the Wapiti is said to be perhaps more nutritious than that of any other Deer; and its skin makes the most valuable leather, preserving its suppleness even after being saturated with water, on which account it is always prized by the native Indians. The red man hunts the Wapiti by forming a cordon of mounted men around a herd, detaching selected animals and then riding them down to a standstill; or sometimes a whole herd would be driven over a precipice. In more modern times, however, the rifle is most frequently employed, for the Wapiti is by no means difficult to approach, and a shot in any part of the body is usually sufficient to lay the big animal low. The Indians not infrequently keep the animal in captivity, using it as a beast of burden and for draught purposes.

The Altai and the Manchurian Wapiti of Asia are very similar animals, less in bulk, but with antlers bigger in proportion. These Deer appear to agree with the suggestion that the American Wapiti originally reached the New World from Asia by way of Bering Strait.

MISCELLANEOUS AMERICAN DEER.

The Elk, Reindeer, and Wapiti are in many respects allied to different species in the Old World; but the remaining Deer of the New World show marked differences in the construction of the skull and in the shape of the antlers. There are no brow tines, and the beams consist either of simple spikes or branches of a fork-like character. The chief species are the following:—



ANTLERS OF THE VIRGINIAN DEER.

The Virginian, or White-tailed Deer (*Cariacus virginianus*) is by far the commonest Deer of North America, different varieties ranging throughout the United States from Mexico to Canada. It is a graceful animal, slightly smaller than the Fallow Deer, with a coat of reddish yellow in summer and light grey in winter. The antlers differ a great deal in the several varieties, but the front prong of the main fork is generally

better developed than the hinder one.

The animal is shy and timid, and as it is extremely speedy and an excellent swimmer, its capture is by no means easy. A well-known hunter describes it as 'an exasperating little beast,' in whose haunts the sportsman on foot must needs almost crawl if he wish to bag his quarry. Often the Deer make their home in cane-grass seven feet high, through which the hunters ride on horseback, driving

before them the animals, which dash away in a series of leaps, in which they show their backs above the tall grass. Mr. Selous states that he shot one when it was quite six feet off the ground.

The Mule Deer (*Cariacus macrotis*), found in the Missouri basin and in the Sierra Nevada and the Rocky Mountains, is slightly larger than the Virginian Deer. Its distinguishing features are the enormous size of its ears and its great double-pronged antlers, which attain a length of over two and a half feet, with a span of nearly forty inches. In summer, when its coat is thinly haired, the Mule Deer retreats to very near the snow line to avoid tormenting flies.

The Pampas Deer (*Cariacus campestris*), as implied in its name, is a South American species with a coat of reddish-brown, glossy hair. The antler boasts of but three points, the two at the extremity being far more developed than the fine midway along the beam. When a hind and her fawn are approached by an enemy—hounds, for example—the mother and the young one adopt an extraordinary method to secure their safety. The fawn will dash away at the top of its speed for perhaps a distance of over half a mile, where it will lie down in concealment. Meantime the mother stands still until the dogs are close upon her, when she too sets off, but in an opposite direction to that taken by the fawn. She will at times slacken her speed, and even assume a limping gait, all the while enticing the pursuers from the original starting-point. At length she will increase her speed, and, working round to rejoin her fawn, will often get clear away from the hunters.

The Browsers, of which there are several species in the northern portion of South America, are small animals from one and three-quarters to two and a quarter feet in height. The antlers of the full-grown male consist only of simple spikes, such as are carried by the Red Deer in its first year.

The little Venada, or Pudu Deer (*Pudua humilis*), with its rounded head and rather large ears, is not much larger than the common hare. Its antlers are but two tiny spikes. The home of the animal is in the Chilian Andes.

ASIATIC DEER.

AXIS DEER (*Cervus axis*).

Plate XXXVIII. Fig. 2.

The Axis, or Spotted Deer, of India and Ceylon, about the size of the Fallow Deer, though varying somewhat in colour in different regions, is generally a rich golden brown, with a dark stripe along the back and a white streak across the haunches. The chief feature of the animal's coat are the large white spots, arranged in almost longitudinal lines, making the Axis, or Chital, as it is called, one of the most beautiful of the Deer tribe.

One might suppose this spotted coat would make the Chital a conspicuous mark for the hunter. The opposite, however, is the case; for the covering harmonises with dead vegetation and the flecks of sunlight passing through the dense foliage. The three-tined antlers often exceed three feet in length.

The Axis Deer breeds naturally in October, but in English and French parks, into which the animal has been successfully introduced, the birth of a fawn at such a time would expose the young animal to the severe weather of winter. It is a singular provision of nature that the acclimatised animals do not give birth to their young until June—that is, about the same time as the Deer among which they have been introduced.

SAMBAR (*Cervus unicolor*).

Plate XXXVIII. Fig. 1.

The Sambar, or Gerow, is the largest of the Rusine group of Deer, the antlers of which consist of a brow tine and a simple bifurcation of the beam. It is a woodland animal that is widely distributed in India and the south-east of Asia. The finest representative of a number of similar animals, the Sambar is the largest of the true Deer, outside the Elaphine group, of which the Red Deer is the most con-

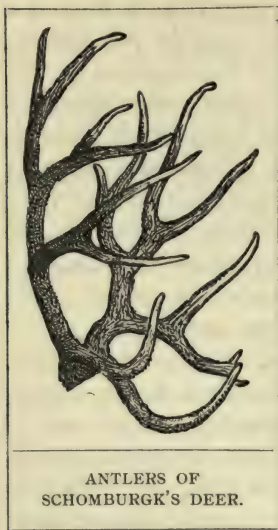
spicuous example. A fine Sambar varies from four to five feet in height at the withers, and attains a weight of as much as seven hundred pounds.

The general colour of the rather shaggy, wiry hair is a deep brown, but of rather a yellowish tint in the female. Among the Indian Deer the fawn of the Sambar is the only one that is unspotted. The antler consists of a brow tine followed by a roughly ridged beam from three to four feet in length, breaking into two fairly equal snags at the top. Save for their size, and the fact that the long brow tines curve sharply upwards, the antlers of the Sambar are similar to those of the Spayad or Red Deer in its third year. It is said that in some cases the stags do not shed their antlers for two or three years.

The Sambar is nocturnal in habit, frequenting jungly, wooded hills, seldom in herds greater than a dozen, except in the pairing season. It is quite remarkably tenacious of life, and it is only when struck by a shot in one of a few vital spots that the animal falls in its tracks. It is usually stalked or beaten, but in Ceylon Sir Samuel Baker used hounds to run it down. In the chase of a fine buck he describes how 'the whole pack was around him; but not a hound had a chance with him, and he repeatedly charged in among them, and regularly drove them before him, sending any single hound spinning whenever he came within his range.' When the hunter broke cover within a few yards of the quarry 'his mane was bristled up, his nostril was distended,' as he commenced carefully to pick his way along narrow precipices with the whole pack in single file at his heels. The thrilling hunt continued, the buck leaping across some boiling rapids, only to alight upon a steep crag, from which he fell into the torrent, into which some of the dogs also rolled over in a confused mass. The Deer escaped, and at length reached a platform from which it could not proceed, while the pack prevented the animal returning upon its tracks. He made a dash into the pack, striking out with his horns and his forefeet, and then sprang into the abyss below, at the bottom of which he was afterwards found with all his bones broken.

A somewhat similar animal is the Swamp Deer, or

Barasingha (*Cervus duvuacelli*), Plate XXXV. Fig. 2, though there is a difference in the antlers. The brow tine,



ANTLERS OF
SCHOMBURGK'S DEER.

about a foot in length, extends almost at right angles instead of sharply upwards, and the prongs of the bifurcation again divide. The bucks attain a weight of from thirty to forty stone.

In Schomburgk's Deer (*Cervus schomburgki*) the antlers are very similar in formation, except that the beam is shorter and the forward prong considerably smaller than the hind one.

Eld's Deer (*Cervus eldi*) possesses a very distinctive antler. The brow tine bends down over the forehead and then upwards to form a well curved hook. The beam does not bifurcate until very near the top, where the short fork

breaks out into perhaps eight or even more points. The length of the antler may be anything from forty inches to very nearly five feet.

The food of Eld's Deer is mainly grass, but if a herd finds its way into the paddy fields the agriculturist is left lamenting. In habits these Deer 'are very wary and difficult to approach, especially the males. They are also very timid and easily startled; the males, however, when wounded and brought to bay with dogs, get very savage and charge vigorously. On being disturbed they invariably make for the open. . . . It commences by giving three or four bounds like the Axis, or Spotted Deer, and afterwards settles down into a long trot, which it will keep up for six or seven miles on end.'

The Burmese formerly hunted Eld's Deer on a large scale, the men of neighbouring villages combining to 'encircle three or four moderate-sized herds with long strings, upon which plantain leaves were tied so as to flutter in the wind. . . . The Deer, afraid to pass the scare-

crows, got gradually driven together, until they were completely surrounded and at the mercy of the hunters.' One battue often resulted in the capture of two hundred deer; and as the species was likely to be exterminated the Government forbade methods of wholesale slaughter.

MUNTJAC (*Cervulus muntjac*).

Coloured Plate XXIV. Fig. 2.

The Muntjacs form a group of small and elegant Deer, often called Jungle Sheep, which are found in India, Burma, the Malay Peninsula, and some of the larger islands of the Indo-Malayan Archipelago. The diminutive antlers are simple in character, and take their rise from bony, skin-covered knobs, not at all unlike the horns of the giraffe. Commencing below the eyes are two elongated ridges running obliquely downwards, V-shaped, gaining for the animal the name of Rib-faced Deer.

The Indian Muntjac, or Barking Deer, so called from its peculiar cry, is the best known of the five different species. In size it is less than the Roe Deer, being but two feet in height and weighing only about twenty-eight pounds. It is one of the most beautiful animals of its race. Its hair, of a dark-reddish fawn colour, is close and shiny; its limbs are slender and agile; and its eyes are large and brilliant. The antlers, only five or six inches in length, consist of but the undivided beam and a brow tine.

The Kakar, as the animal is frequently called, is a hill-dweller, rarely being seen on the plains. It can make its way at a great speed through the densest jungle, and, owing to the difficulty of getting anything like a sure aim, hunters use a charge of shot in preference to a bullet. By means of rather long tusks in the upper jaw the bucks frequently gash pursuing hounds severely.

There are numerous other Asiatic Deer, of which only briefest mention of several may be made. The Sika, or Japanese Deer (*Cervus sika*), is common in Japan and Northern China. In colour it is a beautiful brilliant chest-

nut, thickly spotted with white. When in velvet the antlers are a bright chestnut red with black tips, giving the bucks a strikingly handsome appearance. This animal has been introduced into many English deer-parks. The males are small but strong, and often carry off the hinds of the Red Deer in face of the bigger red bucks.

The Chinese Water Deer (*Hydropotes inermis*) frequents the beds of rushes along river banks. Even the bucks possess no antlers. Strangely enough, John Chinaman does not care for the flesh of the animal, and consequently it exists in rather large numbers. The Water Deer is an adept at concealment; in the park at Woburn Abbey, where the Duke of Bedford keeps many specimens of foreign deer, it is often difficult to discover the animal even in a grass paddock.

The Chinese Elaphure, or David's Deer (*Cervus davidianus*), is practically only found in the Imperial hunting park at Pekin, where M. David, a French naturalist, first saw it from over the wall in 1865. Four years later a pair was obtained for the Zoological Gardens in Regent's Park. The antlers of the Elaphure are unlike those of any other Deer. The beam ascends very abruptly, throwing off very near to the base a back tine of enormous length. The Chinese call it the Sze-poo-seang, which signifies 'Like none of the Four,' i.e., the animal resembles neither the horse, cow, deer, nor goat.

MUSK DEER (*Moschus moschiferus*).

Coloured Plate XXV. Fig. 1.

The Musk Deer of Central Asia, and the Himalayan region in particular, was long one of the accredited wonders of the animal kingdom. It so differs in various particulars from any other of the Deer, that some naturalists prefer to view it as forming a distinct family of its own. The absence of antlers in both sexes is not wholly a distinctive characteristic. Three special peculiarities are not external. The Musk Deer is the only one of the Cervine family that possesses no gall-bladder to the liver, which is so common a

feature in the Bovine family ; it has a simpler form of brain than in any other Deer ; and the musk, from which the animal derives its name, is secreted in an abdominal pouch, technically named the pod. When it is first removed from the animal the odour is so overpowering that the dealers are obliged to envelop their nostrils in cloths, lest bleeding at the nose should ensue. The musk is not only valuable for perfumery purposes, but it also possesses useful medicinal qualities.

The dentition of the Musk Deer calls for notice, in that the canine teeth of the upper jaw are so greatly developed that they remind the observer somewhat of those of the young walrus, being sometimes three inches in length. At one time it was believed that these tusks were intended to insure the animal's safety, and that when it was hunted



SKULL OF THE MUSK DEER.

and could not escape from the hounds it sprang into the boughs of the nearest tree, hooked its tusks upon a branch, and hung there until the hounds had passed by and lost the scent. With increasing knowledge this pretty fiction became entirely exploded.

The feet of the Musk Deer are quite distinctive, the hoofs being widely cleft, while the large lateral hoofs are almost equal to claws. The animal is almost, if not quite, as sure-footed as the chamois, ascending and descending the most frightful precipices with the greatest ease. It inhabits the loftiest mountain ranges, its favourite haunts being the pine forests, although in summer it goes much higher than the region of pines. It is nocturnal in habit, in addition to which it is exceedingly timid. Little wonder that before the invention of long-range rifles the capture of an adult male was an event in a hunter's life.

Standing from twenty to twenty-four inches in height, the Musk Deer is about the size of the Roe Deer, but it is much more clumsily built. It is covered with long, coarse brittle

hair, varying in colour from a rich dark brown to a mixture of brown and whitish yellow.

Though it is a watchful and timid animal, the natives of these wild regions contrive to capture the Musk Deer in a manner at once easy and profitable. On the ridges which separate the valleys frequented by the animals they erect fences, with gaps at intervals, in which traps are concealed in the ground. Rather than jump over the obstruction the animals elect to pass through the gaps, in the course of which they tread upon a bough that releases a noose to entangle the feet. At intervals the trappers collect the snared animals and reset the traps.

'No animal,' says Captain Kinloch, 'seems more indifferent to cold, from which it is protected by its thick coat of hollow hair, which forms as it were a sort of cushion, which acts as an insulator, and enables the Deer to lie even on snow without much loss of animal heat. It is amazingly active and surefooted, bounding along without hesitation over the steepest and most dangerous ground. Its usual food seems to be leaves, but the natives say that it will eat snakes.'



1. Llama



2. Camel

Chapter XI

ORDER VI.—UNGULATA

Sub-Order 4.—ARTIODACTYLA (*continued*)

GROUP II.—TRAGULINA (CHEVROTAINS).

GROUP III.—TYLOPADA (CAMELS).

GROUP IV.—SUINA (SWINE-LIKE ANIMALS).

Group II. Tragulina : The Chevrotains—Kanchil. Group III. Tylopada: General description—Arabian Camel—Bactrian Camel—Llama—Alpaca—Guanaco—Vicuna. Group IV. Suina : Wild Boar—Domestic Swine—Baby-russa—Wart Hog—Peccary—Hippopotamus.

CHAPTER XI

Order VI.—Ungulata

Sub-Order 4.—ARTIODACTYLA (*continued*)

GROUP II.—TRAGULINA.

FAMILY TRAGULIDÆ.

THIS group, known as the Chevrotains, Deerlets, or Mouse Deer, consists of diminutive, graceful, deer-like animals, possessing certain well-defined characteristics that well separate them from the true deer. They have no antlers, the upper jaw is furnished with long canine tusks, and each foot has four well-developed digits, approximating somewhat to those of the pig. The family really appears to form a link between the deer and the swine. There are half a dozen species of Chevrotains, the Water Chevrotain (*Dorcatherium aquaticum*) of West Africa being the only one that is found outside the continent of Asia.

KANCHIL (*Tragulus pygmæus*).

Coloured Plate XXV. Fig. 2.

The Kanchil, or Pigmy Musk Deer, is a native of Java and various adjacent islands. It is a very small animal, with a body only about as big as a hare or rabbit. Its legs are slender and but little thicker than a blacklead pencil. Little over a foot in height and measuring but eighteen inches in length, except for the ten-inch high

Royal, or Pigmy, Antelope (see p. 336) of the Guinea coast, it is the smallest of the Ungulates. The colour of its rather fine hair is chiefly greyish above, brightening to a reddish tint on the sides, with a broad dark stripe along the back of the neck, and a band running up the chest.

It is difficult to discover the timid animal in grass or jungle. The Kanchil can feign death with a cleverness second only to the opossum itself. Caught in a noose or other trap, the animal will exhibit not the faintest sign of life until it is released from the snare while the hunter resets his trap. The clever animal-actor often seizes the opportunity to dart away into the jungle before an effort can be made to defeat its purpose.

GROUP III.—TYLOPADA (CAMELS AND LLAMAS).

Derived from two Greek words, the first meaning a knot or callus and the second a foot, 'Tylopada' thus signifies feet that are covered with hardened skin instead of being furnished with hoofs. There are but a few species in this group, and they are confined to the deserts of Africa and Asia and the Andes regions of South America. They



FOOT OF THE CAMEL.

are hornless animals. Unlike other Ruminants, they possess incisor teeth in the upper jaw and canines in both jaws. The Camel has six upper and five lower cheek teeth on each side; the Llama has only five upper ones on each side.

There is a marked difference between the feet of the Camel and the Llama. In the former the two toes are elongated and furnished with soft pads like cushions, which spread out and enable the animal to tread the loose sand without sinking or slipping. In the Llama the two toes still retain their length, but the pads are only slightly developed, giving place to two sharp and hard little hoofs

that are of great service in assisting their owner to make good progress over rocky ground.

In the stomach of the animals of this group there are only three compartments, the first and second (paunch and reticulum) of which are fitted with a collection of cells for storage of as much as a gallon and a half of water, upon which the animal can draw at will. Another common feature of the Tylopoda group rests in the fact that the bones of the animals are quite ivory-like in character.

FAMILY CAMELIDÆ.

ARABIAN CAMEL (*Camelus dromedarius*).

Plate XXXIX. Fig. 2.

The One-Humped Camel is the true Arabian species, a large, ungainly-looking animal, nearly seven feet long and standing seven feet high at the shoulder, or about nine feet to the top of the head. Apart from the hump, the back of the animal is long and arched, and the head is set on a long curved neck. In colour the coat of soft, woolly hair is generally reddish grey, though darker and even quite black animals are not unknown. Pads of hard skin take the place of hair on the chest and leg joints, which points would otherwise suffer when the Camel kneels or lies down.

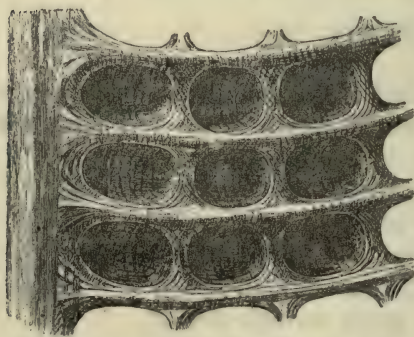
The ears of the animal are small and rounded, and the eyes are protected by large eyelids and eyebrows; the large nostrils can be closed at will. The eyes and nose are thus capable of being protected during the terrible sandstorms that are common in the desert. The lips are mobile, and the upper one is cleft like that of the hare, the better to take hold of food to draw it into the mouth. The Camel is a ruminant, but nevertheless it has incisor teeth in the front of the upper jaw, but in the adults only a single pair remains.



BONES OF
FORE FOOT
OF
THE CAMEL.

The legs of the Camel are long and slender, notwithstanding which their looseness gives them a flabby and rather straggling appearance. Reference has already been made to the cushioned feet of the animal, which specially adapt it for traversing sandy deserts. It is often stated that the Camel is quite unfitted for walking on hilly or stony ground ; but the Camels of Sinai can pick their way with remarkable celerity amongst boulders and in rocky places that would often puzzle a mountain pony.

On wet and slippery roads the Camel is simply helpless, and is very apt to dislocate its hind legs. They slide asunder on a treacherous surface, and the animal is unable to bring them back ; and the result is that the weight of the



WATER CELLS OF THE STOMACH OF THE
CAMEL.

body, to say nothing of a burden, forces the bones out of their sockets, and nothing can be done with the unfortunate creature but destroy it.

The qualities which make the Camel invaluable in desert regions are its powers as a pack animal and of subsisting with little food and absolutely no

drink for comparatively long periods. It can dispense with water without discomfort for several days, but in face of dire necessity it can exist as long as ten days, travelling during the whole of that period and carrying a fairly heavy load. It sometimes happens that when the water contained in the skin bags of the travellers is exhausted, a Camel is sacrificed for the sake of the liquid which remains unconsumed in the stomach.

Often the Camel saves the caravan from destruction by the exercise of its faculty of scenting water at a great distance, bending its course directly towards it, and even going to the length of breaking its halter if the driver fail to understand the animal's instinctive knowledge.



1. OKAPI.
(See page 341)

2. DROMEDARY.

(Photo W. S. Berridge, F.Z.S.)

70 3000
ALBION 100

The hump or 'bunch' on the back was at one time popularly supposed to be the water reservoir, whereas it is composed of fatty cells which form a reserve of food. There is something analogous to this in the hibernating animals, which are always particularly fat when they retire, and extremely lean when they make their reappearance after their long sleep. In the case of the Camel the store of fat is restricted to the hump, which is fat and plump when the animal is well fed and lightly worked, shrinking almost to nothing in a trying journey during which food is scarce.

In Arabia there is at least a score of different breeds, but for all practical purposes they are either baggage animals or fast riding Camels, which last are usually known as Dromedaries. Small animals are loaded up to eight hundred pounds and large ones up to half a ton, with which they will move along at the rate of two and a half or three miles an hour. A good Dromedary, such as the swift breed, the Heirie, will travel eight miles an hour and keep up that pace for a long time; seventy or eighty miles a day will be maintained for successive days, totalling in some cases a distance of six hundred and thirty miles in five days. In their figurative language the Arabs describe the capabilities of their fast Camel couriers thus: 'When thou shalt meet a heirie and say to the rider, *Salem alic* (Peace be between us), ere he shall have answered thee, *Alic salem* (There is peace between us), he will be far off and nearly out of sight, for his swiftness is like the wind.'

The Arabian Camel is found not only in Arabia but Syria, Asia Minor, Persia, Afghanistan, and India; and it is common in Egypt and Northern Africa generally. It has been introduced among other places into the South of Europe, United States, and Australia. In the New World it was not a success, and the few animals in Italy are very inferior to those on the other side of the Mediterranean; but in Australia the Camel has proved invaluable in the desert regions, and the thorough exploration of the interior would have been practically impossible without it.

Though the Camel is used in harness as a draught animal

and in agricultural labour such as ploughing and harrowing, it is as a beast of burden that it renders inestimable service. The internal trade of desert countries would be impossible without this 'ship of the desert.' In North Africa, for example, caravans of Camels, sometimes to the number of a thousand, regularly cross the terrible ocean of sand, the great Sahara, to and from the coast regions; or traverse the burning wastes of Arabia just as at the time when Joseph was sold to 'a company of Ishmaelites from Gilead with their camels, bearing spicery and balm and myrrh, going to carry it down into Egypt.' Caravan Camels are those of the largest kind. With only a single feed of beans during the day, or a handful of dates or small balls of barley meal, with perhaps occasionally the dry and thorny plants found at some points in the desert routes, the animal forges along without exhaustion or even the desire for better fare.

Nor is the Camel of less importance to the wandering Arab than he is to the merchant. He loads it with his tents, his wealth, and his family, and traverses the ever-moving sands from one oasis to another. An astonishing load can be piled upon a Camel—bales on the back, panniers at the sides, or children in a bag on one side, a young camel in a bag or net on the other. A mixed collection of merchandise, waterskins, and cooking utensils, all are carried with submissive docility.

Notwithstanding its extreme usefulness the Camel is one of the least intelligent of animals. Unlike most mammals, it has no instinctive notion of swimming; it has the greatest possible aversion to water; and when fording a river under compulsion, should it happen to lose its footing, it will simply roll over and allow itself to drown. It is, too, quite devoid of sympathy, and never comes to an understanding with its master, such as a dog or a horse naturally acquires. Patience it may possess, but it is the patience of stupidity, and there is no knowing when the animal will not change it for an unmovable obstinacy and an exhibition of a most vicious temper, to which the bitten arm or shoulder of a driver often bears painful testimony. Its revengeful disposition is always a positive danger, and in this respect it

perhaps shows intelligence in an undesirable direction, as evidenced in the following incident:—

A Camel, working in an oil-mill, was beaten by the driver. For several months the animal gave no sign that it bore ill-will for the punishment. One moonlight night the man, while sleeping in an unaccustomed spot, awoke in time to perceive the animal steal softly to a heap of clothes that bore some resemblance to his own sleeping figure. With the greatest fury the Camel threw itself upon them, rolling with all its weight and tearing them to rags with its teeth. When it had completed its work of destruction the driver spoke to the animal, and such was its chagrin at the failure of its purpose that, in a fit of uncontrollable rage, it dashed its head against the wall and died on the spot.

Riding a Camel is an unpleasant and even painful process for a beginner. The action of the animal as it first gains its feet is singularly discomposing. The saddle has two upright wooden horns, between which the rider sits. When he is seated and the Camel released, the animal suddenly plunges upwards with its forequarters, so as to place its feet on the ground. Almost before the rider has recovered from the shock, the hindquarters are elevated with similar quickness, so that a novice has all the breath knocked out of him by alternate contact with the two horns. And then comes the monotonous back-breaking jolt as the Camel swings along on the two legs of one side at a time, not adding to the comfort of the inexperienced rider by its habit of snatching at intervals at any tempting thorn or green branch in its path. The Camel is not bitted, but guided by a string attached to a noose fitted tightly round the nose. To say it is guided is a mere figure of speech, for it is difficult to direct the animal in any way except that which it proposes to follow.

The Camel is to the Arab what the reindeer is to the Eskimo. Not only does he use it for burden, but he feeds almost wholly on the thick, rich milk, mixed with meal; the tents in which he lives, and the great mantle, or burnous, which he wears—such as was worn by Elijah, and bequeathed to Elisha—are made of the Camel's hair, of which it is despoiled annually. The skin is valuable for many

purposes ; of it are made tents, shields, harness, saddles, trunks, &c.

Of the real history of the Camel little is known. Whether Asiatic or African, there is no record of a Camel that was not the property and the servant of man from the time when Abraham possessed oxen, asses, and Camels (Gen. xii. 16), or when the sons of Reuben took from the Hagarites when "they were delivered unto their hands, of their Camels fifty thousand." The Beni Sakkar Arabs, who now dwell in the Hagarites' country, are said to possess a hundred thousand Camels ; and the sheikh of the Anazeh, one of the foremost Bedouin tribes, can put into the field ten thousand horsemen and ninety thousand Camel-drivers.

BACTRIAN CAMEL (*Camelus bactrianus*).

Coloured Plate XXVII. Fig. 2.

The Bactrian Camel, inhabiting the desert regions of Central Asia, is recognised at once by its double hump. It is a heavier animal, and its legs are shorter and its hair longer than in the foregoing species. The legs in particular render it better fitted for traversing rocky regions than its Arabian relative. In habits and disposition the Bactrian Camel is very similar to that of Arabia, and to the nomads of Central Asia it is every whit as important from an economic point of view. The Persians use it for their celebrated Camel artillery, a light swivel-gun being mounted on the saddle and worked by the rider.

In the Gobi Desert are wild Camels that are supposed to be the descendants of domesticated animals which have escaped from captivity. Over two centuries ago a rather populous district, Taka Makun by name, was swept by a devastating sandstorm. It is said that not a single human being escaped, but probably some of the Camels survived, and it is from these animals that the present wild ones took their rise. They are exceedingly difficult to capture, for in the deep, loose sand of these regions horses are quite helpless in the chase.

LLAMA (*Lama glama*).

Coloured Plate XXVII. Fig. 1.

Of the genus Llama there are four species, two wild and two domesticated, but strictly speaking the title is confined to the latter. Though they are smaller in size, lighter in build, and without the hump of the Camels of the Old World, they are all formed on much the same model, yet at the same time fitted for a very different life. Instead of being natives of flat and sandy ground, they are inhabitants of the lofty and snow-clad mountains of Peru and Chili, traversing them with an agility little inferior to that of the chamois by means of the two sharp, hard hoofs that take the place of the small nails which are quite sufficient for the Camel.

The ancient Peruvians domesticated the wild Guanaco, from which in the course of time they bred two distinct varieties, viz., the true Llama, as figured on the Plate, which was used as a beast of burden, and the smaller Alpaca, domesticated in a less degree mainly for the sake of its wool. Both animals vary considerably in colour, being white, or white marked with brown or black, and sometimes completely brown or black.

Standing from three to four feet in height, and very much resembling a long-necked sheep, the 'American Camel' can carry a load of a hundred pounds at a rate of twelve miles a day; and on a journey it can manage on very little food and travel for four or five days without water.

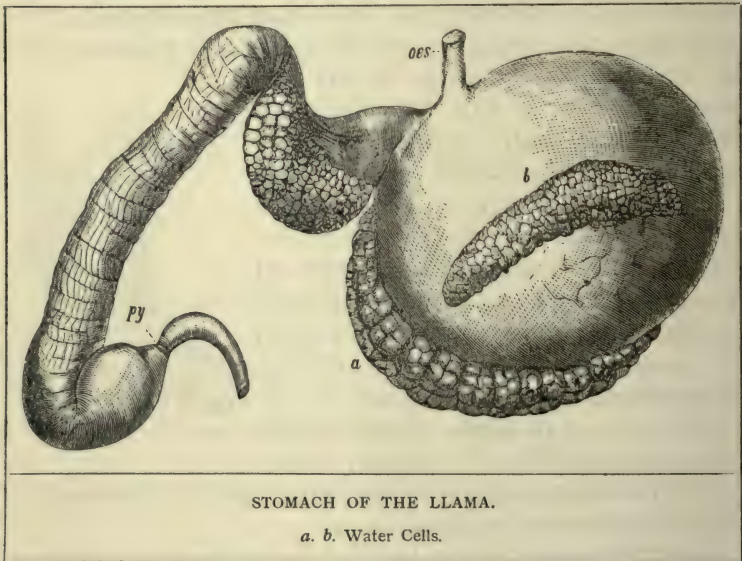
The Spaniards, in their conquest and occupation of South America, made much use of the Llama as a pack animal, for in those days there were no horses or asses in the New World. Gregory Bolivar said that in his day there were three hundred thousand Llamas carrying silver ingots from the Potosi mines alone to the coast, and that annually several millions of the animals were used for food. Only



FOOT OF THE LLAMA.

the male Llamas were pack animals, the females being kept for the sake of their milk and flesh. A long file of Llamas would traverse the broken mountain steeps, the highest passes, and narrow ledges of precipitous rocks with remarkable surefootedness.

In disposition the Llama is much like the Camel. It will only go at its own speed, and will frequently sulk and lie down if it consider its load is too heavy. Rather a remarkable characteristic of the Llama family is that of spitting in the faces of persons with whom an animal is annoyed. If a



man is riding one of the animals and the Llama feels tired, it turns its head round and discharges a mouthful of offensive saliva into the rider's face. Visitors to zoological gardens have often experienced unpleasant proof of this objectionable habit.

ALPACA (*Lama pacos*).

The covering of the Alpaca, more often brown or black than in the Llama, differs from that of the latter very much as does the wool of the sheep from the hair of the goat.

Except for its longer neck, which it carries very erect, the animal is more sheep-like than the Llama. The Alpacas are pastured on the high mountain tablelands during the greater part of the year, being brought down into the valleys only at the shearing season. Alpaca wool, which is yellowish brown, or grey, or white, or black, was first used by the natives for making tent covers and similar purposes. It was also made into coarse sacks for the transmission of goods. When emptied, these sacks were destroyed as useless. But the late Sir Titus Salt, when quite a young man, invented a set of machinery which could deal with the peculiar fibre of the wool, bought for a trifle all the old bags that he could procure, and set up the machinery that gave rise to the great factory of Saltaire in Yorkshire.

The Alpaca is one of the very few animals which the white man has not transferred with success from its native home. A large herd that was imported into England led to no useful result, and in different parts of Europe similar attempts ended in failure. Australia appeared to be the likeliest region to suit the animal; but as a herd of three hundred dwindled down to a dozen in about five years, it seems to point out that the Alpaca is not likely to be added to the many more or less cosmopolitan animals of the world.

GUANACO (*Lama guanacus*).

The Guanaco, or Huanaco, the ancestor of the present-day Llama, extends throughout the Andes region from the Equator to Cape Horn. The coat, rough and short, is usually brown in colour. Though exceedingly wild and wary, the animal has little idea of defending itself, but the males fight furiously among themselves.

The animal is said to retire to some secluded place when it is about to die; and Darwin found certain spots near the Santa Cruz river that were white with bones. This strange habit has given rise to considerable discussion among naturalists. The most probably correct explanation is, that long ages ago the Guanaco in the severe weather came down from the heights to the wooded valleys for warmth. An animal approaching its end would feel cold from its

own decreasing vitality, and hence it would seek cover under the bushes where its remains have been found.

VICUNA (*Lama vicunia*).

Plate XL. Fig. 1.

The Vicuna, about two and a half feet high, is smaller and of lighter build than the Guanaco, and its habitat is more restricted, being chiefly in the region of which Peru is the centre. It is generally found at greater and much colder heights than the foregoing member of the Llama family. Its coat is more or less light brown, with white underwool.

The Indians hunt the Vicuna for its flesh which is excellent, and its wool, which is of remarkably fine quality. The weapon employed is the *bolas* (see p. 129), which is whirled round the hunter's head and then released, to go with unerring aim at the flying animal, and entangle its feet. In olden times as many as twenty thousand men would engage in a grand drive over an area of twenty square miles, when the bag would include not only hundreds of Vicunas and Guanacos, but deer, bears, pumas, and other animals.

At one time it was made an offence to kill the Vicuna; hunters were to shear it, and then set it at liberty. Owing to the wildness of the creature this was found impracticable, with the result that continual hunting has greatly reduced the number of the animals in this species.

GROUP IV.—SUINA.

All the members of this group are non-ruminant, pig-like animals, generally with four toes on each foot, although there are exceptions in which the hind feet possess but three. The teeth consist of two or three incisors, one canine, and five or six molars on each side of the jaw. Though at least one family is particularly numerous as to individuals, the group includes but three existing types.



1. VICUNA.

2. WART HOG.

(See page 389)

(Photos W. S. Berridge, F.Z.S.)

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FAMILY SUIDÆ (SWINE).

All the Swine have elongated snouts with the nostrils at the end ; the ears are often large and flapping ; the eyes are small ; and the bodies are often nearly naked, or with a sparse covering of bristly hair. Their favourite location is in damp, swampy regions. The upper canine teeth of the male in particular are long and flattened, slightly curved, and so sharpened that they cut like knives when used as weapons. The feet are narrow, with four toes on each. In a wild state Swine are mostly herbivorous, but will eat flesh when the opportunity offers. The illustrations show that Swine, which do not chew the cud, yet divide the hoof.

WILD BOAR (*Sus scrofa*).

Coloured Plate XXVIII. Fig. 1.

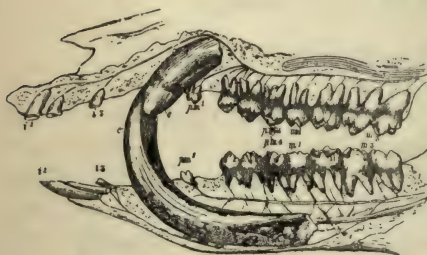
The Wild Boar, the only European specimen of the family, was once exceedingly abundant in Central and Southern Europe, and it is still common in the more remote, well-wooded regions, such as the Black Forest, &c. Practically the same animal extended into Western and Central Asia as well as into the North of Africa. It formerly roamed in the forests of Britain, and was another of the animals that William I. protected and preserved with such severity. In later times the animal died out ; Charles I. imported fresh animals into the New Forest, but during the Civil War they were all destroyed.

The shape of the Swine's head shows that it is intended to force its way through forest undergrowth, the wedge-like snout assisting to make a passage to allow the body to follow easily. The snout is also used for grubbing up ground in search of food ; and as the animal possesses an acute sense of smell, nothing escapes it as it turns up the soil. Wild Swine are chiefly vegetarians, but, urged by a voracious appetite, they eat insects and reptiles, even the fangs of the viper having no terrors for them. In North America the domesticated Pig will kill and greedily devour the dreaded rattlesnake, the poisonous stings

taking no effect on the hard hide and its protecting layer of fat.

Though the Wild Boar differs considerably in appearance in various regions, the European specimen will well serve for the others. Its colour is a dusky brown, or grey with a tendency to black. The elongated head is set on a short neck that rises out of a thick and muscular body. It is variable in size, but is usually about four feet long and three feet in height. The canine teeth in the males are long and powerful and project beyond the upper lip. The female is less in size and the tusks are not nearly so large. The young ones are white and generally marked with yellow longitudinal stripes.

The Indian Wild Boar (*Sus cristatus*) is larger than the



TEETH OF THE WILD BOAR.

European animal and is one of the most formidable beasts that can be met in the chase. 'Pig-sticking' is a favourite sport in India, surrounded by all the elements of danger, not only on account of the natural pugnacity of the

animal, but the added difficulty of making progress in the jungle where it makes its home. It is not much less active than a cat, and its average weight of three hundred pounds enforces the necessity of care in approaching it. When it meets an enemy, it plunges forward and with a wriggling movement of its head inflicts two deep cuts, one to the right and the other to the left.

The old Boars are generally solitary, but the females and young are found in parties of ten or twelve up to as many as a score. It is the male that is particularly dangerous, for the lower tusks are sometimes a foot in length and quite capable of ripping up a horse. Bruce relates being requested by some natives to rid a district of Wild Boars that had frequently ravaged their crops. 'Amongst us all we killed five boars, all large ones, in the space of about two hours,



1. Wild Boar



2. Babyrussa



3. Hippopotamus

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one of which measured six feet nine inches; and though he ran at an amazing speed near two miles, so as to be with difficulty overtaken by the horse, and was struck through and through with two heavy lances loaded at the end with iron, no person dared come near him on foot, and he defended himself above half an hour, till, having no other arms left, I shot him with a horse-pistol.'

Captain Shakespeare describes a hunt in which a gaunt animal made an amazing fight for its life. It was speared in its withers, but wrested the weapon out of the officer's hand, snapping the shaft in two as it darted into the jungle after a fierce run of seventy yards. In reaching cover the Boar ran under the horse of a *shikarry*, lifting up the animal and causing its rider to be thrown to the ground. When Captain Shakespeare, leaving his horse because of the undergrowth, came up with the animal, three dogs were holding it at bay. The Boar, perceiving his approach, charged down upon him, receiving a bullet in the neck from a distance of only fifteen yards. This failed to stop its career, as did a second shot that broke its under jaw-bone. The next instant the Captain was knocked completely over, the Boar wounding him in the left arm as it ran over him, and almost in the same instant another native was hurled to the ground as the infuriated animal again took flight. A third shot pierced the creature's brain, and it fell dead without a groan.

Sir Samuel Baker in Ceylon often hunted the Boar on foot with dogs and armed only with a hunting-knife, with which to meet the animal at close quarters. He says it abounds in the low country in astonishing numbers, where it is a useful scavenger in clearing up the carcasses of dead animals. The natives prize the flesh of the Wild Boar, but the Englishman never fancied it after seeing the animals gorging themselves upon a putrid elephant. Ceylon Boars often scale at least four hundredweights, though Sir Samuel Baker reports having sighted one that must have weighed double.

The Wild Boars of other regions such as East India islands, Japan, Northern Africa, &c., are too much alike in appearance and habit to render description useful or specially interesting.

DOMESTIC SWINE (*Sus scrofa*).

Coloured Plate XVIII. Fig. 2.

The true Swine accommodates itself to circumstances, and there are few parts of the world into which man has not introduced it. The Jews regarded the animal as the most unclean of all beasts, and, much as the Mohametans hate the Jews, they were in hearty accord in their detestation of the Swine. To our minds the chief idea in the Parable of the Prodigal Son is that of the discomfort

BONES OF THE
FOOT OF THE PIG.

and hunger of the wandering spendthrift; but to the Jews it conveyed unspeakable degradation in keeping Swine belonging to another man; it indicated the most abject humiliation, for a Swine-keeper was abhorred as much as a leper. In the Scriptures the mention of the animal is restricted to the domesticated species, except in one instance, in Psalm lxxx. 13—'The boar out of the wood doth waste it, and the wild beast of the field doth devour it.'

In all probability the Common, or Domestic, Swine all the world over are the descendants of either the European wild species or its relatives of India; but the various breeds have been crossed and intercrossed to such an extent as to baffle inquiry.

Some of the results of domestication are very apparent, notably in the bodily form of various breeds. The Irish Greyhound Pig, as implied by its name, is a long-legged, lank-bodied, high-withered, narrow-headed animal; while the Harrison Pig has short legs supporting a huge cylindrical trunk, the belly of which nearly touches the ground. The Berkshire Pig, one of our most valuable breeds, is inferior in point of size, and is a much more shapely and alert-looking animal than many others, which are just more or less cylindrical masses of flesh and fat. The Japanese Masked Pig has 'an extraordinary appearance, from its

short head, broad forehead and nose, great fleshy ears, and deeply furrowed skin. Not only is the face furrowed, but thick folds of skin, which are harder than the other parts, almost like the plates on the Indian rhinoceros, hang about the shoulders and hindquarters.' The best Chinese breed, small-bodied and short-eared, has been largely used to improve the stock of European breeders. It is impossible to attempt to particularise more of the different breeds, each of which possesses some good point either in its size or the quality of the meat.

The Domestic Swine of the United Kingdom are chiefly pen-reared animals that only in autumn are turned loose in the woods to feast on acorns, walnuts, beech-mast, &c.; but in many countries they are at best half-tamed creatures which are allowed to roam over vast expanses of wild country. In many cases the animals escape and revert to a wild state, and in course of time work no small havoc in cultivated districts, often necessitating their extermination by settlers and colonists. This was the case with the Bush Pigs of South Africa, and the same thing has occurred in New Zealand and other regions where domesticated animals have been able to avoid the control of their owners.

It is remarkable how the importance of Pig rearing varies in different stock-raising countries. In the British Isles there are, roughly, four million Pigs to thirty million sheep and eleven million cattle. Australasia has but one million Pigs to a hundred million sheep. The Argentine possesses only about three-quarters of a million Swine to seventy-four million sheep and twenty-one million cattle; but in the United States are forty million Pigs to about the same number of sheep and cattle. Austria, Russia, and Germany are also big Swine raisers, the two former possessing about ten million each, while the last named has half as many again.

These figures show the immense importance of Swine in providing food for man. Pork is the most popular meat in France and many countries in Europe. In Chicago alone there are firms which each kill twenty-five thousand hogs a day; and in a single year the United States sends to the United Kingdom alone, bacon and hams to the value of £11,000,000.

Probably no animal living is so wholly useful as the domesticated Swine. Pig-skin makes a leather that is impervious to wet, and particularly serviceable for saddles ; the stiff, strong bristles are utilised in the manufacture of brushes ; even the intestines of the animal are used for sausage skins ; in fact, as the Yankees express it, everything in connection with the hog is useful with the exception of its squeal.

BABYRUSSA (*Babyrussa alfurus*).

Coloured Plate XXVIII. Fig. 2.

The Babyrussa, meaning Pig-deer, inhabits the damp and swampy forests of the islands of Celebes and Boru in the Malayan Archipelago. There is no mistaking the animal for anything but a member of the Pig family ; and a glance at the illustration shows it to be quite as presentable an animal as many breeds of the domesticated Swine.

The distinguishing feature of the male Babyrussa is the manner in which the upper canine teeth grow to a length of fourteen or fifteen inches, appearing through the skin of the face about midway between the muzzle and the eye, curving strongly upwards in semicircular fashion, until they almost, or quite, touch the forehead. The lower tusks are not nearly so long or so strongly curved. It is said that the animal sleeps standing and hooks its upper jaws on to a branch in order to support its head. Another assumption is that the curved horns are to protect the animal's eyes as it rushes through thickets ; but the female's horns are not developed to nearly the same extent as in the male. It is far more reasonable to suppose that at one period the horns were of use to their owner, but in succeeding ages have not been employed and have been allowed to assume their present strange form.

The skin of the animal is dull ashy grey in colour, with but a very sparse covering of bristles. The Babyrussa is almost as swift as any member of the deer tribe, and in disposition is rather fierce. Its habits differ but little from those of Wild Swine generally. It is an excellent swimmer,

and not only enters fresh water in search of aquatic plants, but frequently crosses the narrower sea channels.

The flesh of the animal is highly esteemed, and to obtain it the natives of Celebes organise hunts on quite a large scale. It is captured in very much the same manner as the elephant, the animals being driven into a corral, at the end of which they become entangled in nets, after which they are either bound or speared. The sport is not without excitement, as evidenced in the words of Dr. Guille-mard :—

‘The next moment a magnificent old boar *Babyrussa* rushed past within five yards of us, and plunged into the net between our tree and the entrance to the corral. His long tusks became entangled in the meshes, and the natives ran up to spear him. Just at this moment, however, he broke loose, and, turning on his antagonists, scattered them in all directions. It was a most determined charge, and, as we were unable to fire for fear of hitting some of our own men, it might have proved a serious affair for the native he singled out. Even with four spears buried in his body, the old boar died game, striving to the very last to get at his antagonists.’

WART HOG (*Phacochærus æthiopicus*).

Plate XL. Fig. 2.

If the Red Bush Pig is the handsomest member of the Swine family, the Wart Hog is the ugliest of the whole of the Ungulates, and the order includes a few with certainly no pretensions to beauty. The body is quite pig-like, massive and cylindrical; the neck and back are clothed with long, bristly hair, while the remainder of the skin is practically naked. But it is the head which attracts almost amazed attention. Of enormous size, with a great length of muzzle, and the lower part of the face particularly flat and broad, the head would be remarkable in its ugliness if its characteristics ended there. The eyes are fixed in large protuberances, which enable the creature, when chased, to throw its head upwards and glance at the foe over its back.

HOOFED ANIMALS

Below each eye is a large projection, with two other warty excrescences midway between the eye and the tip of the snout. Two huge upper tusks and a couple of smaller lower ones complete the most unprepossessing physiognomy imaginable.

The animal, of which there are several varieties, ranges from Abyssinia southwards throughout a great part of East Africa. It is swine-like in its habits, feeding much on roots, which it digs up with its tusks. It also excavates deep holes, in which it often lies. It is a much more timid



SKULL OF THE WART HOG.

animal than the Wild Boar, and it will rarely charge even when wounded.

In South-eastern Africa the Wart Hog is known as the Vlacke Vark, *i.e.*, Black Hog. It often occupies the discarded burrows of the Aardvark. In driving the animal out of its retreat a hunter might not unnaturally take his stand immediately at the back of the hole in order to get a shot as the Wart Hog commences its flight. The hunter, however, would not repeat the experiment, for the animal emerges from the hole only to turn a somersault backwards; and any person standing there would test the quality of the sharp tusks on his legs before he could effect a movement to avoid contact with them.

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1. COLLARED PECCARY.

2. AARD-VARK.

(See page 425)

(Photos W. S. Berridge, F.Z.S.)

FAMILY DICOTYLIDÆ (PECCARIES).

COLLARED PECCARY (*Dicotyles tajacu*).

Plate XLI. Fig. 1.

The Peccaries are the American representatives of the Swine, but they are smaller, with the head, snout, ears, and tail shorter, more slender limbs, while the bristles are longer and thicker. There are also differences in the dentition, the upper canine teeth in particular being directed downwards instead of upwards. There are four toes on the front feet, but only three on the hind. In one respect the Peccary is in advance of its Old World cousin : it possesses a more complex stomach, very nearly approaching that of the ruminants. The animal differs in still another point. In the middle of the loins, just below the skin, is a scent gland which pours out a fluid of disgusting odour, that renders the flesh uneatable, unless the gland is removed immediately after the animal is killed.

The Collared Peccary is common in a great portion of the United States and Central South America, extending from Arkansas to Patagonia. It rarely exceeds three feet in length with a height of sixteen inches at the shoulder. In colour it is blackish brown with yellowish white on the flanks. It derives its name from a line of white which passes from the fore parts of the neck upwards to meet over the shoulders. It is a forest-dwelling, rather timid animal, rarely found in parties of more than nine or ten. It dwells in holes or the hollows of trees, and in the neighbourhood of settled districts ravages the plantations.

The White-lipped Peccary (*Dicotyles labiatus*) is a slightly larger species and infinitely fiercer in disposition. Living in herds, they are often a source of embarrassment to the planter, for they know no fear ; and the hunter is safe from their assault only when he has gained a friendly branch at some distance from the ground. Even the jaguar only succeeds in capturing a straggling member of a herd, and he, too, is frequently forced to seek refuge in a tree.

When in its retreat, however, the Peccary often falls

an easy prey to the hunter. In the holes or hollow logs into which the animals crowd backwards, one always stands on guard with its head outside. If this animal be shot its companions push out the dead body, for another sentinel to take its place, and this operation may be repeated until the herd is disposed of.

The Peccary, like the Swine, subsists chiefly upon vegetable food, but it does not refuse animal substances. In particular it wages war upon lizards and serpents, which it devours with the greatest avidity.

FAMILY HIPPOPOTAMIDÆ.

HIPPOPOTAMUS (*Hippopotamus amphibius*).

Coloured Plate XXVIII. Fig. 3.

The Hippopotamus, or River Horse, is the sole representative of the family ; it frequents the lakes and rivers of Central Africa. The ancient Egyptians called the animal by a name which meant 'river-swine,' which was a far



LOWER JAW OF THE
HIPPOPOTAMUS.

better title than horse, with which animal the Hippopotamus has nothing in common. It is a shapeless, unwieldy beast, attaining a length of from twelve to fourteen feet ; it is four to five feet at the shoulder ; and it may weigh as much as four tons, thus being little inferior to the elephant in bulk. The hide is dense and tough, rough and warty, and naked except for the short bristles at the end of the tail. The male is dark brown in colour ; the female is a yellower shade. The ears are small and rounded, and, with the nostrils, are capable of being closed when the animal is under water.

The head is very large and remarkable in form, the ears, bulging eyes, and nostrils being all set in a line, so that the huge animal can lie in the water, totally submerged except for two or three inches, and yet retain

its power to see, hear, and breathe. The mouth is a cavernous opening fitted with formidable teeth. The jaws possess terrific power, sufficient to crunch a canoe into pieces at a single bite. The enormous curved canine teeth in the lower jaw are sometimes thirty inches in length, with a circumference of nine inches at the base. The largest known tusk was thirty-eight inches over the curve. The lower incisors project in such a manner as to enable the animal to cut grass and reeds as though with a pair of shears; and it has been known to sever a man in two at a single bite.

The Hippopotamus feeds upon riverside herbage and water-plants and roots. From the stomach of a dead animal have been taken six bushels of chewed grass, giving a good idea of the bulk of the fodder required to form a meal. Consequently, if but one animal wanders into a native plantation to satisfy its appetite, it makes a considerable hole in a crop, omitting what it beats down in its ungainly progress.

On land the animal is slow and heavy, though it can travel swiftly for a short distance; but in the river it is perfectly at ease, swimming, diving, or walking along the bottom with the utmost facility and comfort. It is more aquatic than any other of the Ungulates; it can swim at about ten knots an hour, and can remain under water for as long as five minutes, although more generally it is but two.

The hide is of enormous thickness and will weigh as much as five hundredweights when freshly stripped. It is thickest on the back. It is largely used to make the terrible sjambok whips, a blow from which will make a groove in a deal board. In the early days of South African settlement, refractory slaves were often whipped with the terrible scourge. The tusks were formerly greatly prized by dentists, who utilised them in the manufacture of artificial teeth.

The hide and tusks alone make the huge animal well worth capture; and the natives often boldly chase it, and with spears and harpoons kill it by sheer skill and courage. Very often peculiar traps are set in the paths which the animals are known to use on their way to the water. The

monster treads upon a lever which liberates a heavily weighted spear suspended overhead. The weapon, having a poisoned tip, does not take immediate effect, but sooner or later the native discovers the dead body, and thus secures his prize without the danger that surrounds a personal encounter. The huge animal is not particularly tenacious of life—Mr. Neumann once killed four in four consecutive shots.

The Hippopotamus grazes in the night, but during the day it may be seen disporting itself in the water, puffing and snorting and blowing water in jets from its nostrils, or else standing quite motionless with not even the whole of the head above the water. Travellers thus coming upon the monster unawares have had good reason to remember it. Upon one occasion a Hippopotamus not only damaged the paddlewheels of a steamer, but dug holes in the bottom of it with its tusks; and native boats, twenty to thirty feet in length, are frequently hurled completely out of the water.

Dr. Livingstone made acquaintance with the Hippopotamus when much less was known of its habits than is the case to-day, but his observations still hold good in every respect: 'The still reaches are their favourite haunts, as elsewhere the constant exertion necessary to keep themselves from being carried down the stream disturbs their nap. They remain by day in a drowsy, yawning state, taking little notice of things at a distance. The males utter loud, snorting grunts, which may be heard a mile off. The young ones stand on the necks of their dams, and their small heads appear first above the surface as they rise to breathe. The dam, knowing the more urgent need of her calf, rises more frequently when it is in her care.' In several miles of river as many as two or three hundred monsters may still be seen, so that it does not appear likely that the animal is in danger of extinction.

Another species of the family is the Liberian, or Pigmy, Hippopotamus (*Chæropsis liberiensis*), inhabiting West and Central Africa, and especially Upper Guinea. It is a smaller and much rarer animal than the foregoing.

Chapter XII

ORDER VII.—SIRENIA (MANATEES)

**General description of the Sirenia—Manatee—
Dugong.**

CHAPTER XII

Order VII.—Sirenia (Manatees)

THE Sirenia are fish-like, herbivorous mammals that form a connecting link between the Seals and Whales. They are the step between one order that cannot exist out of the sea and another the members of which, while living entirely on the products of the sea, yet spend part of their days ashore, especially during the period when they produce their young. At various times the animals which we are about to describe have been classed with the Whales, the Walrus and even the Elephant.

The most striking peculiarity of the Sirenia, or Sea Cows, as they are often called, is their strict vegetarianism, which alone absolutely separates them from other rigidly carnivorous denizens of the deep ; in fact, they seem as much out of place in the teeming world of waters as antelopes in a jungle infested with tigers.

MANATEE (*Manatus australis*).

Coloured Plate XXX. Fig. 1.

The Manatee inhabits the shallow seas and the river estuaries of the Gulf of Mexico ; in West African waters is found a very similar species. Their food consists chiefly of marine and aquatic weeds.

The body of the animal is oblong in shape, terminating in a lengthened oval tail which is placed vertically. The front limbs, which are only exaggerated fins, are capable of

rendering prehensile service. The name Manatee is derived from *manus*, a hand, on account of the hand-like construction of the flippers, in which the bones of the four fingers can be very distinctly traced. The skin, dark brown or nearly black in colour, is exceedingly hard and tough. Though usually only seven or eight feet in length, a twelve-foot Manatee with a corresponding increase in girth is no unusual occurrence.

In various of its characteristics the Manatee somewhat closely resembles the seal, notably in its nostril-shaped blow-holes, its large, expressive eyes, whiskers on the muzzle, and a sprinkling of hairs on the body. The teeth are practically restricted to molars, for the incisors at their best are very rudimentary.



SKELETON OF THE MANATEE.

It is said that the Manatee gave rise to the idea of the mermaid. Considering that it is a supremely ugly animal, one can scarcely understand it being taken for a lady of the exquisite and attractive beauty that is popularly attributed to the mermaid. Nevertheless, from the pose of the head and the suddenness with which it pops up, at a distance on a bright moonlight night perhaps it would present sufficient resemblance to the human form divine to excuse the generic name, *Sirenia*.

It is permissible to doubt whether the mythological siren by her song ever inspired ecstatic devotion in those who heard her ; but it is an absolute fact that the Manatee clings to but one mate, whom it will not leave even in the face of death, and both parents display a corresponding fondness for their young. It is said that the young are placed

in the centre of a school when dangerous enemies are near.

In the regions where the Manatee abounds it affords excellent food, having somewhat the taste of coarse pork; Humboldt declared it was equal to the best of ham. South American monks prefer to view the animal as a fish, as they do the whale family, and thus the Manatee provides sumptuous fleshy fare for the season of Lent.

Mr. Bates, who captured a Manatee in a canoe voyage on the Amazon, does not praise the flavour of its flesh as some other travellers have done. 'The meat was cut up into cubical slabs, and each person skewered a dozen or so of these on a long stick. Fires were made, and the spits stuck in the ground, and slanted over the flames to roast. The meat has somewhat the taste of coarse pork; but the fat, which lies in thick layers between the lean parts, is of a greenish colour, and of a disagreeable fishy flavour.'

DUGONG (*Halicornes dugong*).

Coloured Plate XXX. Fig. 2.

The Dugong is a native of eastern waters, various species being met with in the Red Sea and as far east as Australia. The best known is the one illustrated, which differs from the manatee chiefly in the variation of its tail, which takes the form of a crescent-shaped flapper. The creature is sometimes regarded as a veritable cow of the 'sea pastures'; and certain it is that along the coast of Queensland, especially in river estuaries, it may be seen snatching tussocks of long grass at the edge of the water, when it comes up to breathe. This is the fullest extent of its grazing propensities; it never leaves the water in search of vegetable food. The Dugong more often than not exceeds the manatee in size, and the male is furnished with two large tusk-like teeth, which are never found in a manatee of either sex. Its flesh when roasted is said to taste like pork and veal combined, and the Mahome-

tans, whose religion bans the pig, esteem the flesh of the porky marine mammal as a great delicacy. The Malays view the creature as a 'royal fish,' just as we still do the sturgeon, and the native Kings claim all that are captured within their territories. 'When cured, the flesh is considered in Queensland a relishing article of diet for the breakfast table, having the flavour of good bacon with just an agreeable "bloater" twang added. The tail, which is very fat, is much esteemed, and is generally soured or pickled.' The Dugong yields a particularly clear oil, the commercial value of which gives rise to important fisheries, especially in Australia, that threaten to exterminate the creature. The skin can be dressed into useful leather. A German writer has attempted to prove that the Tabernacle of the Israelites was roofed with Dugong skin. As the animal is found in the Red Sea it was possible for it to have been put to such a use. Further than that we cannot decide.

One species, the Rhytina, which was the real Sea Cow, attained a length of twenty feet. In the comparatively short period of thirty years it was swept off the face of the earth in the unceasing pursuit of the creature for the sake of its oil.



1. THE CACHALOT'S FIGHT FOR POWER.

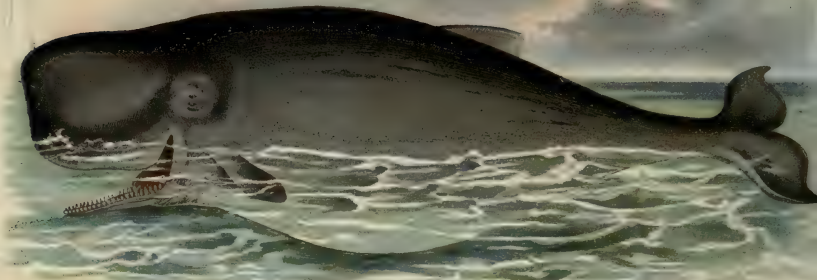
2. A SPERM WHALE BABY.

(See page 411)

Chapter XIII

ORDER VIII.—CETACEA (WHALES AND DOLPHINS)

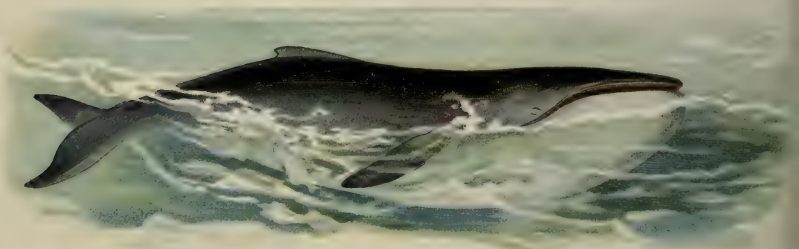
General description of the Cetacea—Greenland Whale—Southern Right Whale—Common Rorqual—Humpback Whale—Cachalot or Sperm Whale — Narwhal — Porpoise — Dolphin—Killer Whale.



1. Cachelot



2. Greenland Whale



3. Humpbacked Whale

CHAPTER XIII

Order VIII.—Cetacea (Whales and Dolphins)

UNDER the general name of Cetacea, *i.e.*, the Whales, are classed together a wonderful group of marine Mammalia, which includes not only the true Whales, but also the Dolphin, Narwhal, Porpoise, and Grampus.

Notwithstanding their marked resemblance to fishes, the Cetacea possess the most indubitable mammalian characteristics. By means of lungs they breathe atmospheric air; their warm blood is pulsated by a four-chambered heart; and they produce living young, which in their youthful stages derive nourishment from the milk that they draw from their mothers. Usually there is only one young one at a birth, Rorquals proving the exception in sometimes having two offspring.

Though the Cetacea vary in size and differ in many details, they all agree in certain additional points. With the exception of a West African species of Dolphin, which is at least partly herbivorous, these marine mammals are carnivorous. They possess no hind limbs, but use a horizontal appendage to propel their bodies through the water; and this form of tail is particularly serviceable in assisting the animal to rise quickly from a great depth to the surface. The fore limbs are composed of four or five digits, which are only visible in the skeleton. Many species possess a dorsal fin. Underneath the skin is a thick layer of fat, from eight to twenty inches in thickness, which is called blubber. Whaling men speak of it as the 'blanket.' The

fat serves the animal for warmth, and in addition renders the huge body exceedingly buoyant; a dead Right Whale, for example, weighing over two hundred tons, will float; but when the carcase is skinned it sinks.

The order of the Cetacea is divided into two sub-orders. In the Mystacoceti is the single family Balænidæ. In the members of this family there are two nostrils, or 'blow-holes,' and instead of teeth the mouth is fitted with plates of baleen, popularly and wrongly termed 'whalebone.'

It may be here noted that baleen is not bone, but is analogous to hair. Dip a tuft of hair in any gelatinous substance, and when dried a transverse section placed under the microscope will well represent a section of baleen (see Fig. D in the illustration).

In the sub-order Odontoceti, which includes all the remaining Cetaceans, teeth always appear in one or both jaws, baleen is absent, and there is but one external 'blow-hole.'

To speak of whale-fishing is really a misnomer, yet there is an intimate industrial and commercial connection between sea fisheries proper and the systematic hunting of the Cetacea and the Pinnipedia, or Seals. Oils, seal-skins, furs, baleen, spermaceti, ambergris, and ivory are no inconsiderable additions to the finny food-harvest of the sea.

FAMILY BALÆNIDÆ.

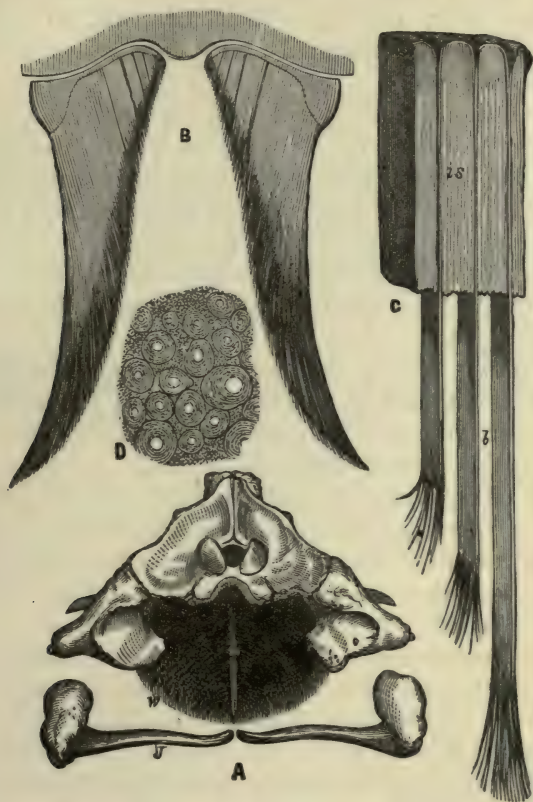
GREENLAND WHALE (*Balæna mysticetus*).

Coloured Plate XXIX. Fig. 2.

The Greenland Whale, or 'Right Whale,' is a denizen of the Arctic seas. Nowadays specimens exceeding fifty feet in length are rare, but before the creature was so remorselessly hunted it more often attained maturity and a length of seventy or even eighty feet.

The 'Right Whale' has no teeth, but hanging transversely from the upper jaw are some six hundred plates or strips of baleen, varying from one inch in length at the ends of the mouth to a dozen or even sixteen feet in the centre. These

dangling strips, which are even on one edge and fringed on the other, cause the mouth of the Whale to look as though it were lined with a coarse hair mat. The length of the baleen gives some idea of the size of the Whale's mouth,



BALEEN OR WHALEBONE.

- A. A back view of the whale's skull, with the baleen flakes (*w*) spreading out from the upper bones (*m*) of the skull. The lower jawbones (*j*) are shown as removed from the skull.
- B. Baleen flakes with fringed edges.
- C. Three flakes on a larger scale set side by side.
- D. Baleen cut across and magnified under the microscope.

and it is not without reason that sailors assert, that a ship's jolly-boat with crew complete could row into the cavernous aperture without touching its sides.

The use of the baleen is to strain the myriads of small

molluscs and jelly-fish which the leviathan takes in its open mouth, as it leisurely passes through the water at a rate of about four miles an hour. The tongue, an immense mass of fat nearly two tons in weight, rises up and forces out the water between the plates of fringed baleen as through a sieve, leaving a mass of food to pass down the Whale's gullet, which is only one and a half inches in diameter.

Notwithstanding its enormous dimensions, the Greenland Whale is mild and inoffensive; it leads a timorous and slothful life, perhaps chiefly due to its hampering immensity and the fact that its food costs it so little effort to obtain. It does not even attack its pursuers, and accidents to whaling boats are caused by the sudden diving of the quarry, or the boat approaching too near in its tremendous death-struggles.

The young Whale measures from ten to twelve feet in length at birth, and its mother suckles it for about a year. A school of these northern Whales usually consists of a bull and a couple of cows, each with a calf.

The whaling business has been depressed for many years. Half a century ago the whalers of one Scottish port alone would account for fifty or more Whales in a season. Nowadays not half that number are captured by all the Scottish boats combined; and the animals are smaller, on an average yielding about one hundred and thirty barrels of oil instead of formerly perhaps twice as much. The quantity of baleen varies from one to three thousand pounds. Thanks to the substitution of steel for many articles that formerly called for whalebone, gas and electricity for lighting purposes, and the increasing competition of vegetable and mineral oils, Whale hunting is probably never likely to attain its former prosperity. Some authorities maintain that there is really no appreciable diminution in the number of Whales, but that modern methods are responsible for decreasing catches. Steam screw vessels have replaced the old sailers; and it is said that the revolving screws give notice to the sensitive hearing of the Whale that enemies are at hand, with the result that the prospective prey immediately seeks haunts where lies a greater measure of safety.

SOUTHERN RIGHT WHALE (*Balæna australis*).

The Southern Right Whale structurally is almost identical with its northern congener; in habitat it is exceedingly different. The Greenland Whale is never seen in Temperate waters, and it is a mystery what it does with itself during the long Arctic winter, when all the Polar seas are locked under many feet of ice. Open water is absolutely necessary to the existence of any marine mammal, yet the most enterprising whale-fishers seek it in vain during the long night of the Arctic regions. The Southern Right Whale, on the other hand, prefers the waters outside the Antarctic Circle, and is found in large numbers as far north as the Cape of Good Hope. Formerly French whalers hunted the southern waters with fair profit to themselves, but in recent years they have ceased operations, and it is doubtful whether a dozen Whales are taken in the course of a year, and those more by accident than of set purpose. Consequently the Southern Right Whale is increasing in numbers, and there are many thousands of square miles of silent seas away from the tracks of ocean-going steamers, where immense herds of Whales live out their lives with only the fear of their strictly natural enemies.

COMMON RORQUAL (*Balænoptera musculus*).

The Common Rorqual is a typical species of the 'finners,' as sailors term them; the generic name means 'Finned Whale,' in reference to the small back fin that lies near the region of the tail. It attains an enormous size; one caught in the North Sea was ninety-five feet in length, twenty-two feet in width, and weighed over two hundred and fifty tons.

Rorquals are the most widely distributed of all the larger Cetaceans; they are found nearly everywhere outside the Antarctic regions, and are by no means uncommon in British waters. Sometimes when one has been driven ashore it has been an object of curiosity to visitors drawn from far and wide. A little later the sanitary authorities

have been at their wits' end to get rid of the mountain of decaying flesh that was proving a menace to the health of the district.

The Rorqual is viewed with particular disfavour by fishermen, for in the stomach of a dead Whale have been found no less than nine hundred codfish. But the Whale piles up injury upon injury. It not only disposes of vast quantities of fish that might be put to more profitable use by the toilers of the sea, but calmly swims through thousands of pounds' worth of their tangled nets, while with each gulp it takes in boat-loads of herrings, mackerel, or other kinds of edible fish. Finally, as if it had not worked sufficient mischief, it causes the shoal to split up into sections, which seek to escape the visitation in deeper waters further out at sea, leaving the fishermen to bewail the loss of what might have proved to be a golden harvest.

In the palmy days of whale-hunting the Rorqual was practically unmolested, for not only is the yield of blubber relatively small, and the baleen scanty and poor in quality, but the animal is speedier than the Right Whale, and consequently it is far more difficult to kill and secure it. The trouble lies in the latter. Owing to the thinness of its 'blanket' of blubber a dead Rorqual promptly sinks to the bottom, and no plan of the ordinary whaler could prevent the weight of perhaps two hundred tons or more passing out of his reach.

The scarcity of the Greenland Whale and the advancing price of baleen, which has a value of about £2,000 a ton, have made the capture of the Rorqual more of a necessity than in former days. Modern ingenuity has robbed the chase of some of its dangers, while increasing the certainty of retaining the capture. The Norwegians, perhaps, make the most commercial use of the Rorqual, and their method will well serve as one example of modern whale-hunting.

'Small steamers like the "jackal" tug-boats of the Thames are fitted out. In the bows they carry a cannon, designed to fire a massive harpoon, instead of a shot or shell. To the harpoon is attached a stout rope, far stouter than ordinary whale-line, which is one and a half inches in girth. A powerful steam windlass is fitted in the bows also.

‘Presently coming up with the whale, the gun is fired, the great harpoon buries itself in the quivering monster, sometimes, indeed, with a small bomb in its head. With scarcely any exception, once the harpoon has found its mark, the fate of that Rorqual is sealed. The wound is so deep, the strain is so great, that in a short time it succumbs and sinks dead.’

When the windlass is started the immense carcass is towed off to a shore station, where not only the blubber and baleen are secured, but every other vestige of fat is utilised to swell the tale of oil barrels. The huge mass of offal and bones is converted into manure. It is a brutal business, robbed of the merest claim to sport; but it at least gains for the Rorqual hunter a precarious living in return for arduous toil not unmixed with frightful perils. The Greenland Whale is hunted in a very similar manner, except that its buoyant carcass is dragged to the side of the whaling vessel, instead of ashore as in the case of the Rorqual.

When a shoal of Rorquals approaches the coast of the Faroe Islands the fishermen at once put out in boats. Strangely enough, the Whales do not dive under the boats and escape, as they might easily do, but allow themselves to be driven into a bay. Along the shore stands a dense crowd of women and children, with a sprinkling of veterans whose whaling days are over, yet who hasten from all parts to witness the spectacle. As soon as the Whales are in the cove, with the boats forming a serried line across its mouth, the signal is given to the men, spear in hand, standing in the bows.

The spears whiz through the air and the oarsmen shoot forward into the terror-stricken shoal, driving it into the shallows. Timber crashes and splinters as boats collide, and the wretched creatures, with quivering spears embedded in their flesh, spout jets of blood. Some men leap overboard, and, with long knives held in their teeth, wade chest high towards animals that flap helplessly in the shallow water. Others lean over the sides of the boats, thrust great iron hooks into wounded Whales, and, in spite of their frenzied struggles, hack through to the spinal column.

The Whale drive, with the strategic skill involved, may possess all the zest of sport, but the massacre sickens one with its barbaric savagery. At such a moment it is difficult to remember that the seemingly merciless butchers are but honest toilers filling the winter larder according to the immemorial Faroese custom. By the time the last victim's agony is over the water of the bay is literally crimson, the men are dripping and blood-smeared. Then, suddenly as it began, the hubbub subsides, and the ferocious whale-hunter becomes once more the peaceable Faroeman.

HUMPBACK WHALE (*Megaptera böops*).

Coloured Plate XXIX. Fig. 3.

A glance at the illustration will show the dorsal erection like a dumpy fin which gains for the animal the name 'Humpback'; but the most marked difference between this species and those already described rests in the greater length of the arms, hence justifying the generic name, which signifies 'great wings.' Attaining a length of forty-five to fifty feet, with flippers from ten to fourteen feet long, the Humpback ranges through the seas of all latitudes between the two frozen oceans.

All Whales are grievously afflicted by parasites, barnacles, limpets, and slimy sea-grass that cause the monsters unbearable irritation. The Humpback probably suffers more than any other of the tribe. The belly blubber is divided into longitudinal folds with grooves over two inches in depth, in which limpets breed with but little fear of removal, even when the Whale drags its vast body over submerged rocks or along the bottom of a coral reef.

Humpbacks usually yield but a moderate amount of oil, often only ten barrels, though sometimes an extra blubbered specimen will furnish ten times the quantity. In common with the Rorqual, the Humpback is nevertheless hunted more frequently than was formerly the case. Off the coast of Norway and the north coast of Ireland they are occasionally very numerous. Short excursions that end in the capture of a number of poor Whales may really result

in more profit than a prolonged voyage to the far distant North in search of the more elusive Right Whale.

FAMILY CATADONTIDÆ.

CACHALOT (*Catadon macrocephalus*).

Coloured Plate XXIX. Fig. 1.

The Cachalot, or Sperm Whale, is 'long-headed,' as indicated by its generic name, and indeed its head occupies about one-third of its total length of from fifty-four to sixty feet. Probably when the species was more abundant, larger ones were encountered; in any case it is still one of the largest of the Cetaceans. In each side of the lower jaw of the Cachalot are set twenty conical teeth of immense size and strength, which grow from below as fast as they are worn down above. The teeth are sometimes nine inches in length, nine inches in girth, and weigh quite three pounds. In the upper jaw there are no teeth, but grooves into which the teeth fit. When once the mouth is closed no creature living could extricate itself. This peculiarity of structure is valuable, bearing in mind that the staple diet of the Sperm Whale consists of gigantic squids or cuttle fishes, whose slippery bodies need some special provision to ensure a firm grip of them.

Sperm Whales are found chiefly in the open and warmer oceans, and that they travel from one ocean to another has been satisfactorily proved. In the Atlantic Ocean have been caught Whales in whose bodies were fixed spears, which were mementoes of unsuccessful attacks upon the monsters by natives of the Pacific islands.

Sperm Whales are gregarious, and when the animals were more numerous schools of several hundreds were not uncommon; the present-day whale-hunter would rejoice if he encountered a school of forty or fifty. Generally only one young one is produced at a birth, and it is weaned when it is about a month old (Plate XLII. Fig. 2).

Though the mouth of the Cachalot is devoid of baleen, the animal in other directions atones for the lack of it.

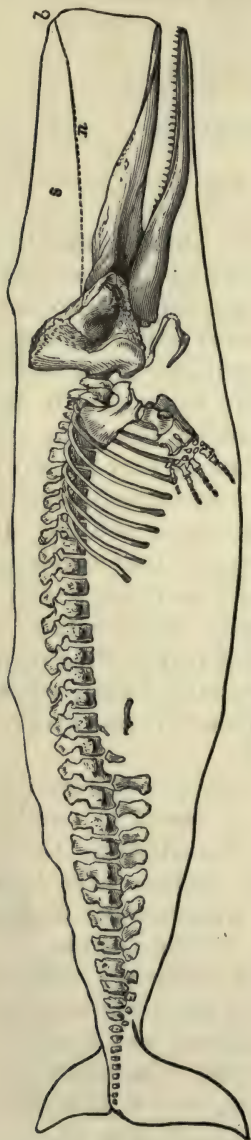
WHALES AND DOLPHINS

The blubber oil is of a finer quality, and fetches a higher

price than that of most other Cetaceans. Reference to the skeleton of this Whale shows a large space between the upper jawbone and the top of the head. During life this space is filled with liquid and limpid spermaceti, which is a peculiar product, much lighter than oil, and which, when purified, assumes a white, flaky form, of great service in the manufacture of candles and for some medicinal purposes. Ambergris is another valuable product of the Sperm Whale. It is a solid, fatty substance of particular value in the manufacture of perfumes. It is a product of the bile of the Whale, which is found not only in the intestines of the animal, but is more often picked up at sea in ejected masses of fifty and even a hundred pounds' weight. Refined ambergris is worth about £5 an ounce, which at once indicates the scarcity of the substance.

In disposition the Cachalot is very unlike the timorous Greenland Whale. In Sperm-whaling the demolition of boats by wounded Whales was quite a common incident. An infuriated Whale has smashed a boat by blows of its enormous flukes,

and then chewed its timbers into matchwood. Instances are upon record where wounded and maddened monsters have



SKELETON OF THE SPERMACETI WHALE.

s, Spermaceti cavity; n, Nasal passage (dotted line); b, Blowhole.

ferociously rammed full-rigged ships and sent them to the bottom. It is well within the bounds of probability that many a vessel that has disappeared, without leaving the slightest clue to its fate, came to grief through accidental collision with, or as the result of deliberate attack by, a Whale. Even full-grown Whale cows are gentle and inoffensive creatures; but there are furious conflicts between the young bulls for choice of mates, and also between the older ones for the leadership of a school (Plate XLII. Fig. 1).

The Whale is an astonishing animal, and in order that it may subsist a number of apparently contradictory conditions must be reconciled. It is a warm-blooded mammal, and yet spends its life wholly in cold water. In order to dive to great depths it must be able to make its body heavier than a corresponding bulk of water, and conversely at will make it lighter in order to reach the surface. Though breathing atmospheric air through nostrils, the animal can exist at a greater depth than where the pressure of the water would force its particles into solid oak, and yet no water can reach the Whale's lungs. It must be able to exist without breathing at all for at least the space of an hour. With the bones, ears, and eyes of a mammal it has to move, hear, and see as though it were a fish. Difficult as these problems appear, they are by no means impossible of explanation.

In order to prevent the heat of the Whale being absorbed by the cold water the animal is fitted with a modified skin called 'blubber,' into the composition of which non-conducting oil very largely enters. The fibres, instead of being flattened out, as in the skin of most mammals, are converted into innumerable cells, and thus even from a wound there is practically no escape of oil.

The Whale is able to sink at will without diving. It has but to contract its exceedingly powerful *panniculus carnosus* (see p. 92) to diminish its body in size and cause it to be heavier than its own bulk of water. The relaxation of the muscle restores lightness to the body, and a few powerful strokes with the tail will afford sufficient velocity not only quickly to reach the surface, but to throw the huge body completely out of the water.

The average human being finds himself taxed to the utmost to remain under water for a minute, and even those who have specially developed the capacity of their lungs cannot remain for longer than from two and a half to three minutes. The ability of the Whale to exist for as long as an hour without breathing does not depend upon an abnormal development of the lungs, for an hour's supply of air would occupy the space of several large balloons, and would give more aid in flying than in sinking.

The object of respiration is to purify the blood (see p. 24), without which the whole nervous system would become paralysed and death would ensue. It is impossible for the Whale to take a supply of air down into the depths of the ocean; but it can take down a supply of purified blood upon which it can draw and gradually substitute for the fluid which has been robbed of its life-giving qualities. In addition to ordinary arteries and veins, the Whale possesses a blood reservoir called the *intercostal plexus*, which is a vast mass of small tubes which are neither veins nor arteries.

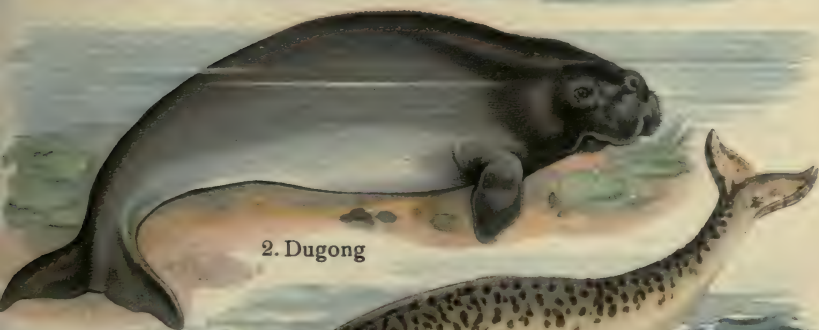
'Spouting' or 'blowing' is but the operation of purifying the reservoir of blood. When the animal comes to the surface, after submergence, it first expels the air in its lungs, with which it connects the plexus as it takes its first deep breath. By repeated expirations and inspirations the Whale restores purity to the blood in the plexus, and then breathes quietly like any other mammal. The fountain-like appearance of spouting is easily explainable. The ejected air is saturated with hot water vapour which the cold external air at once condenses into a column of steam or spray; but not infrequently the Whale commences blowing before it actually reaches the surface, and then the column is reinforced by the addition of a considerable amount of sea water.

An oft repeated question is, Could a Whale swallow Jonah? Putting aside the meaning of the word which is rendered as 'fish' in the Old Testament, and as 'whale' in the New, let us view Whales as they really are. It may be accepted as a fact that a fish no larger than a good-sized herring would choke a Greenland Whale. In the case of

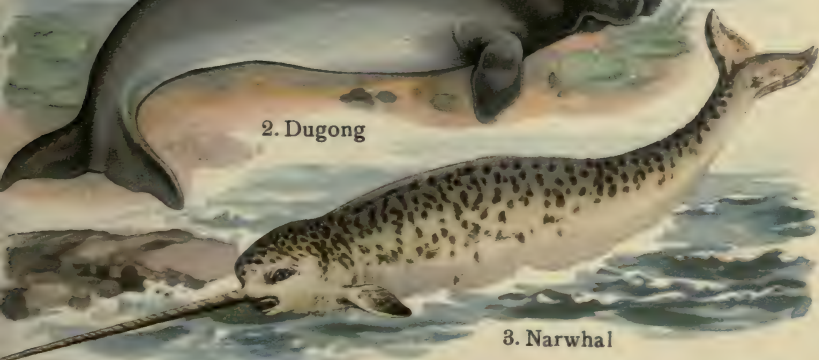
Plate XXX.



1. Manatee



2. Dugong



3. Narwhal



4. Killer Whale



5. Dolphin

the Cachalot it is a very different matter. Most Whales in their death-throes eject the contents of the stomach, and a dying Cachalot will frequently vomit masses of cuttlefish as big as a fair-sized feather bed. But even if we accept the rendering 'fish' we shall still be in as good case. There still exist sharks that can swallow a man whole, and certain extinct species are known to have attained a length of a hundred and twenty feet. Such a monster would not have hesitated at Jonah, but would have welcomed the greater part of the crew that threw the prophet overboard.

There are other large and almost equally interesting species of the Cetacea of which space alone forbids any detailed description. Various economic products of the Whale have been referred to, but there is no Cetacean that does not serve for food in many countries, and especially in the Arctic regions. The Eskimo will eat the raw flesh of the Whale with immense relish. In Barbadoes and other West Indian islands the Humpback flesh is preferred to beef. In the South Pacific the natives view a stranded Whale as a special dispensation of Providence. An Australian traveller describes the feast of a whole tribe of aborigines upon a Whale, which had come ashore in a region where perhaps food was none too plentiful. 'It was a sorry sight,' he says, 'to see a pretty young woman entering the belly of the Whale, then gorging herself with blubber, and issuing forth anointed from head to foot, and bearing in each hand a trophy of the delicacy in question.'

FAMILY DELPHINIDÆ.

NARWHAL (*Monodon monoceros*).

Coloured Plate XXX. Fig. 3.

The Narwhal, which is now limited to one species, attains a length of fourteen or fifteen feet. In the walrus was noted an exceptional form of the canine teeth, which in the case of the left tooth of the Narwhal

is still more abnormally developed into a long, twisted, yellow ivory horn. Occasionally it is the right one that thus grows to a length of perhaps ten feet; but very rarely does the creature possess two horns. Its habitat is restricted to the Arctic regions, in the shallower waters of which it stirs up sluggish fish preparatory to despatching them with its sharply pointed horn.

The natives of the frozen North believe the Narwhal is simply the male of the Beluga or White Whale, and save for the horn they have a marked resemblance in structure. But the Beluga leaves the sea to pursue salmon far up the Alaskan rivers, which the Narwhal is never known to do.

The Narwhal is of considerable economic importance, for it yields an oil much superior to that of the Whale. A tusk of ivory eight feet or more in length, with a basal girth of seven or eight inches, is of no little value; it would be doubly so but that throughout its length the tusk is hollow.

PORPOISE (*Phocæna communis*).

The Porpoise, five, six, or seven feet in length, is common in the North Atlantic. Often off the British coasts a shoal of Porpoises may be seen frolicking quite near to the shore. Passengers on board ocean-going liners are always interested in watching the sportive 'black pigs,' as sailors call them. As they race along the side of the ship they seem as though they are invested with something very much like humour, for their wide mouths appear to wear a distinct smile as they rise from a wave to throw themselves into the air, gambol with a friend, or sink again with twinkling eyes brimful of laughter.

The flesh of the Porpoise is a useful addition to the larder in various regions. At one time it was a standard dish at public feasts in England. Sailors, however, will not eat it unless necessity compels. The animals are captured chiefly for their oil, and the skin can be converted into useful leather. The so-called porpoise hide that is so impervious to wet is more often the skin of the White

Whale, whose length of sixteen feet affords a hide well worth tanning. This fish hide is said to make the strongest leather known. It serves capitally for traces, and at one time the Canadian mail-bags were made of it; it will stand much chafing, and hard wear makes little impression on it.

DOLPHIN (*Delphinus delphis*).

Coloured Plate XXX. Fig. 5.

The Dolphin in appearance more closely approaches the fishes than any other of the Cetacean order, and sailors often mistake for it the brilliantly coloured fish, the Coryphæne, which feeds chiefly upon flying fish. In colour the Dolphin is simply black above and white below. It grows to a length of seven or eight feet. The head terminates in a long, pointed, beak-like muzzle, and on each side of the jaw are from thirty to fifty teeth, the lower of which underlock with the upper ones in rat-trap fashion.

The Dolphin is an insatiable fish-eater, and it makes fierce raids upon the shoals of herrings, pilchards, and other fish that abound on the British coasts. It has a cannibalistic habit that is perhaps practised by no other Cetacean. Any one of their number that is wounded is at once torn in pieces and devoured by its voracious companions.

The flesh of the Dolphin is white, full of flavour, and quite equal, if not superior, to cod, but for some undiscovered reason it is sometimes poisonous. No examination or application of any test will assist in marking any undesirable fish; it can only be discovered when it is too late, and the swollen face and distorted features appear to prove to the unfortunate that he made an unwise choice.

Possibly in eating the *Delphinus globiceps*, or bottle-nosed variety, there is less risk. The Faroe islanders in particular catch thousands of them. After the removal of the fat, which is rendered into oil, the flesh is cut into strips as long as an arm, which are hung in and about the houses to dry. The drying process may prove a sore olfactory trial to visitors, but to the islanders the smell is the harbinger of solid creature comforts that they cannot afford to despise.

KILLER WHALE (*Orca gladiator*).

Coloured Plate XXX. Fig. 4.

Of all the Dolphin family, the Killer or Grampus is one of the largest, and at the same time easily the most ferocious. Though it seldom exceeds twenty feet in length, the Orca makes relentless war upon its relations, being the only member of the Whale family that habitually feeds upon marine mammals. That the Beluga should fall a prey to it may not be a matter for surprise, but a party of half a dozen killers will attack a Greenland Whale, whose bulk may be a hundred times that of any one of these wolves of the ocean. In the course of but a few minutes the leviathan will be reduced to a broken, palpitating island of helpless flesh. Having disabled their gigantic prey the ferocious miniature Whales enter the mouth of the giant to make feast upon its soft, succulent tongue. In an incredibly short time hosts of sea-birds above, and myriads of fishes below, in their office of ocean scavengers, set about the task of disintegrating the mighty mass that was so recently instinct with life.

Plate XXXI.



1. Armadillo



2. Three-toed Sloth



3. Pangolin



4. Wombat



5. Great Anteater

Chapter XIV

ORDER IX.—EDENTATA
(TOOTHLESS ANIMALS)

General description of the Edentata—Three-toed Sloth—Two-toed Sloth—Great Ant-eater—Aard-vark—Pangolin—Armadillo.

CHAPTER XIV

Order IX.—Edentata (Toothless Animals)

THE Edentates differ in many points of their structure and still more widely in habits, but in respect of their teeth they are easily in agreement. Some of them are absolutely toothless, and those that can boast of any teeth at all never have any in the front of the jaws, and those at the back are usually of more or less imperfect formation, without enamel and destitute of roots. The order consists of but two tribes, and the existing species are far from numerous. The Tardigrada, or slow-paced tribe, contains only the Sloths; the Effodentia, or diggers, includes Anteaters, Armadillos, and Pangolins.

FAMILY BRADY- PODIDÆ (SLOTHS).

The legs of animals are put to a variety of uses—running, jumping, swimming, digging, or as hands to seize prey and to convey food to the mouth. The Sloth possesses four legs, but does not run, nor leap,



FORE FOOT OF THE THREE-TOED
SLOTH.

rarely swims, and never digs. Of all the animals of creation, the Sloths only hang. They live wholly in trees, not upon the branches, but under them. In Waterton's own words, 'the Sloth moves suspended from a branch, he rests suspended from it, and he sleeps suspended from it.'

Quite naturally one would infer that to lead such a life the Sloths must possess very uncommon muscular powers. A glance at the accompanying illustration will show that strength does not of necessity enter into the question. The claws are of enormous dimensions, converting the feet into perfect hooks. 'When therefore the Sloth has hitched the claws over a branch, no further exertion is required, the suspension being purely mechanical.'

On the ground the Sloth does not belie its name, for the longer fore-arms and the huge incurved claws are ill-adapted for walking. It can only make slow and painful progression by digging the claws into any little depression in the ground to assist in pulling itself along. Early naturalists considered that life must be a burden to the strange creature. But among the trees the Sloth is in its element ; it may be the worst walker among mammals, but it is certainly one of the best climbers.

THREE-TOED SLOTH (*Bradydus tridactylus*).

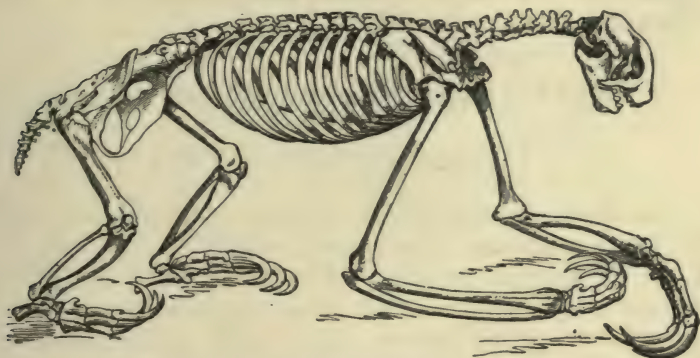
Coloured Plate XXXI. Fig. 2.

Of the several species of Sloths the best-known is the Three-Toed Sloth, or Ai, the latter name being derived from the low plaintive cry of the animal, which somewhat resembles that syllable. It is a native of Brazil. It is but two feet in length, but its shaggy coat gives it the appearance of a much larger animal. The fur is coarse, mainly brownish grey in colour, except between the shoulders of the male, where is a narrow oval patch of black hair fringed with yellow. This patch is exactly like the scorched effect which the application of a hot iron would produce, and at first sight it is difficult to believe that it is not of artificial origin.

Owing to a vegetable alga which grows on the hairs, the

coat of the Sloth very often assumes a greenish tint, which assists to make it not easily distinguishable from its natural surroundings. It is remorselessly hunted by the natives, who regard its flesh as a great delicacy. Its natural enemies are the serpents, but with its terrible claws it is enabled to show fight to good purpose. The vitality of the sloth in particular is remarkable in its approach to that of the reptiles. It can fast for a period exceeding a month, and appears to be impervious to doses of poison that would speedily prove fatal in the case of at least most mammals.

The Sloth suckles its young like ordinary quadrupeds, the young one adhering to the body of the parent until it can take care of itself. The food of the animal is restricted to



SKELETON OF THE SLOTH.

leaves, shoots, and fruits, the moisture of which obviates the necessity of drinking.

In one other particular the anatomy of the Sloth is further modified to suit its peculiar mode of life. Up to this stage in the mammal world it has been the invariable rule that there should be exactly seven bones in the neck. The Sloth possesses nine vertebræ, which enable it to twist its head completely round in either direction while the body remains motionless.

The Two-Toed Sloth (*Cholæpus didactylus*) is a larger animal than the preceding species. When rolled up asleep it looks more like a bundle of hay than a living creature. The lack of a toe only refers to the fore feet, and in other

respects the species too closely resemble each other to call for separate description.

FAMILY MYRMECOPHAGIDÆ (ANT-EATERS).

The animals of this family are marked by long, thick hair and a long tail, which in some species is prehensile. The fore and hind limbs are of an equal length. All Ant-eaters are quite devoid of teeth. In the long, tapering snout is a slender, wormlike tongue, which is remarkably extensile and covered with a glutinous saliva, to which the animal's insect food adheres. Another distinguishing feature is the heavily clawed toes of the fore feet, the third of which is better armed than the others.

GREAT ANT-EATER (*Myrmecophaga jubata*).

Coloured Plate XXXI. Fig. 5.

The Great Ant-eater, Ant Bear, or Tamanoir, is a native of South America. It attains a length of four feet, with a tail three parts as long. The hair is stiff and bristly, mainly ashy grey mingled with black, while there is a conspicuous black stripe edged with white across the shoulders. The tail is remarkably bushy and appears to form the greater part of the animal. Owing to the length of the claws, the Tamanoir cannot walk on the soles of the fore feet, and, although there is not the same hindrance in the case of the hind feet, its gait is extremely awkward.

The Tamanoir is exclusively an insect-eater, preferably termites and ants and their larvæ. Termites, or white ants, as they are often wrongly called, are the most destructive of insects, nothing except metal being able to resist their jaws. But the Ant-eater with its claws assails their sugar-loaf earthen nests, which are strong enough to support the weight of wild cattle. Very speedily the contents are laid bare and the Ant-eater protrudes its tongue to a length of over a foot, and proceeds to lick up its insect delicacy.

Notwithstanding the peculiarly cunning expression of its

eye, this strange-looking animal is perfectly harmless, except when it is roused to defend itself. Its sole method of fighting is to seize its antagonist in its powerful arms, seeking to drive its claws into its body. Dogs are often killed in this manner, and it is recorded that hunters have succumbed to the animal's fierce clasp, in which the terrible claws have penetrated to the heart. It is sometimes asserted that the Tamanoir is a match for the jaguar, a statement rather easily disposed of when one remembers that the American 'tiger' could despatch the slow-going animal by a blow of its paw, to say nothing of one bite with its terrible teeth.

Ant-eaters, in common with the Sloths, are exceedingly difficult to kill. The tough skin resists an ordinary small hunting-knife, and battering the skull with heavy stones will do no more than temporarily stun the animals. Even in its native regions the Great Ant-eater is nowhere common, and it is nocturnal, like all Edentates, which increases the difficulty of learning some of its habits. It is a lonely animal, spending the daytime folded up in the tall grass. Its single young one is carried about on the parent's back for a long time, very often until another is born to displace it.

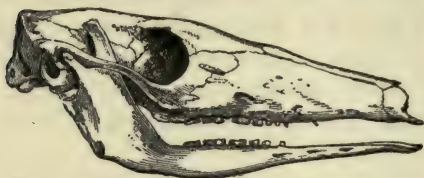
FAMILY ORYCTEROPIDÆ.

AARD-VARK (*Orycteropus capensis*).

Plate XLI. Fig. 2.

The Aard-vark in its general build, long, viscid tongue, and burrowing claws, possesses the typical characteristics of the Myrmecophaga. The Great Ant-eater is a strange-looking creature that, even with its coloured coat and its luxuriant tail, can lay no claims to beauty; but the Aard-vark, with hair as scanty as many species of pig and with a tapering cylindrical tail, has more the appearance of a reptile than a mammal. The ears are exceedingly large, the long, narrow snout is decidedly porcine, and but for its arched back would convey a tolerable notion of a short-legged pig. The

Boers, indeed, gave the name 'Earth-pig' to the Cape Aard-vark, not only on account of its appearance, but also because of its confirmed habit of deep burrowing. To complete the appropriateness of the name, it may be mentioned that the hindquarters of the animal are cured in the same manner as hams, and are almost, if not quite, equally esteemed.



SKULL OF THE CAPE ANT-EATER.

Although the Aard-vark does not possess such claws as the Tamanoir, it is a capital burrower, and in an incredibly short time it can bury its body even

in sun-baked earth. During the day it remains in its burrow, but at night it sets out to attack the nests of ants and termites. It is an exceedingly shy and retiring animal, and for a long time naturalists could obtain but little definite knowledge of its habits. An Ethiopian species possesses a still longer head and ears and a thicker coating of hair. It gives birth to but a single young one at a time, which it suckles for quite a long period.

FAMILY MANIDÆ (PANGOLINS).

PANGOLIN (*Manis longicauda*).

Coloured Plate XXXI. Fig. 3.

The Pangolins are restricted to Asia and Africa. The figured specimen represents the characteristics of the species found in either continent. They are armoured, not with plates, but with overlapping scales like the tiles upon the roof of a house; or, as a writer picturesquely expresses it, they resemble 'an animated spruce-fir cone furnished with a head and legs.'

These scaly Ant-eaters are toothless, and possess the typical extensile tongue of the Edentates, and their feet are armed with excellent burrowing claws. Ants are their staple food. Stones are very often found in the stomach of

the Pangolin. It may be that in the dark they are inadvertently swept up by the viscid tongue ; but it may equally be that they are swallowed purposely to serve as grinders in the gizzard-like stomach.

The Phatagin (*Manis tetradactyla*), a West African species, has a long tail, while the Pangolin of India (*Manis pendactyla*) has a short one. One of the latter species, kept as a pet, endangered the foundations of the house by its constant burrowing. Desiring to kill it, the owner fired at it with a Colt's revolver. The ball failed to penetrate the armour, only knocking the animal over and causing it to roll itself into a ball. A second shot recoiled upon the firer and bruised him. Eventually he despatched the animal by inserting a dagger between the scales and driving it home with a mallet.

FAMILY DASYPODIDÆ (ARMADILLOS).

ARMADILLO (*Dasypus sexcinctus*).

Coloured Plate XXXI. Fig. 1.

There are several species of Armadillo, all of which are found in tropical or sub-tropical America. A description of any one species will practically serve for the whole family. They are comparatively small animals, very distinctively



SKELETON OF THE ARMADILLO.

clothed with plates of bony armour, in the centre of the body so arranged as to permit sufficient freedom of movement to allow the animal to roll itself up for the protection of the softer under parts. One of the smaller species,

the Apra, or Bolita (*Tatusia tricinta*), can thus defy even a jaguar who desires a toothsome morsel.

The Armadillo has an extensile tongue, with which it gathers up ants and other insects. It exhibits great adroitness in capturing a snake, sawing the reptile in pieces with the jagged edges of its armour. But most of the family are omnivorous, welcoming alike animal or vegetable food, fresh or putrid.

For its size the Armadillo, or Poyu, as it is also called, has powerful claws, and its burrowing powers are correspondingly great. The animal is a natural scavenger and renders good service in the removal of decaying animal matter. In South America a dead horse on the plains is no uncommon circumstance. The Armadillo will enter into the carcass and make its home on the spot as long as there is anything left to eat. The natives acknowledge the animal's good services in such a case, but they wish it would manifest a little more discrimination, and then it would not be necessary for them to line the graves of their dead with boards to keep the scavenging burrower from feeding on the corpses of the departed.

Armadillos of whatever kind live in burrows and are mainly nocturnal. There are rarely more than four young ones at a birth, and they are born fully armoured, but with the plates in a soft and flexible condition.

Chapter XV

**ORDER X.—MARSUPIALIA
(POUCHED ANIMALS)**

General description of the Marsupialia—Great Grey Kangaroo—Tree Kangaroo—Wallaby—Rat Kangaroo—Family Phalangitidæ: Spotted Cuscus—Flying Phalanger—Koala—Wombat—Bandicoot—Family Dasyuridæ: Tasmanian Devil or Ursine Dasyure—Tasmanian Wolf or Thylacine—Phascologales—Banded Ant-eater—Pouched Mole—Opossum.

Plate XXXII.



1. Bandicoot



2. Banded Anteater



3. Marsupial Mole



4. Opossum



6. Kangaroo



5. Flying Phalanger

CHAPTER XV

Order X.—Marsupialia (Pouched Animals)

THE animals of this order show such remarkable modifications of structure that they are easily distinguished from those of other divisions of the animal world. The Latin word *marsupium* means a pouch or bag, which is the most marked feature of nearly all the female Marsupials, which originally caused them to be called 'Purse-bearing animals.' Strangely enough, some of the males possess a pouch that can by no means be called rudimentary. The skin of the lower part of the abdomen of the female is doubled upwards in a fold to form a pouch in which are the teats. Into this receptacle the young are introduced while they are in a very immature state, and there they remain until they are able to shift for themselves.

Reference to the skeleton of the Kangaroo, or the Opossum, will show the remarkable prong-like marsupial bones projecting upwards and forwards from the pelvis. Their purpose is to prevent the weight of the young pressing unduly upon the abdomen of the parent, which would incommode, if not prevent, rapid progression. The pouch is modified in various members of the order; in some cases it opens backwards; in others it is the merest rudimentary skin fold; and in at least one instance it is replaced by but a patch of longer hair.

The various families of the Marsupials differ very considerably in their diet. Many of them are strictly herbi-

vorous, some of them are insectivorous, and more than a few are entirely carnivorous. It practically follows in consequence that there will be more or less marked differences in various of their organs, notably those of progression, prehension, and digestion. In one respect the Marsupials are upon the same footing : they possess a very simple type of brain with a corresponding low degree of intelligence.



HIND FOOT
OF
THE GREAT
KANGAROO.

SKELETON OF THE KANGAROO.

Apart from their own special and peculiar characteristics, it would not be difficult to allocate most of the Marsupials to various other orders. The Kangaroo, in its head and eyes, wonderfully resembles the Deer family, and it is said actually to ruminate sometimes ; the Wombat is not unlike the Marmot ; the Bandicoot and Banded Ant-eater closely approach the Insectivora ; the Opossum and Phalanger are practically arboreal Rodents, in some cases approxi-

mating to the Flying Squirrel ; and the Tasmanian Wolf, Tasmanian Devil, and the native Cats, in habits and food, might easily pass for typical carnivores.

The Marsupials are not only distinguished from the rest of the animal world by fundamental structural differences, they are equally separated by geographical location. Except for the American Opossums, the whole order is restricted to Australia, Tasmania, New Guinea, and a few adjacent islands, and save only a few small Rodents, Australia possesses no other indigenous animals.

FAMILY MACROPODIDÆ (KANGAROOS).

GREAT GREY KANGAROO (*Macropus giganteus*).

Coloured Plate XXXII. Fig. 6.

In this family, whose generic name means 'long-footed,' we find the largest as well as the smallest of the Marsupials, suggestive of reflections of the jumping Rodents, such as the jerboa and the chinchilla. In many respects the general form of the Kangaroo is very much like that of the jerboa, the hind legs being exceedingly long.

The Great Grey Kangaroo is the most familiar of twenty-four known species. A full-grown male attains a length of five feet from the tip of the nose to the root of the tail, and weighs anything from a hundred and fifty to two hundred pounds. The neck is thin and finely proportioned, and from it the body expands in pear-shaped fashion to the strong hindquarters. The hind legs, three and a half feet in length, are usually the only limbs used for progression ; the fore legs are only half as long, and are used chiefly as hands, the food being taken with them and held to the mouth. The fore feet each end in five toes, all fitted with strong, curved nails. The hind feet usually have four toes, one of which is nearly a foot in length and armed with a particularly large and solid nail that renders the toe a powerful and formidable claw. The teeth of the Kangaroo are interesting in their structure, the chief points being the singularly long, flattened, and pro-

jecting incisors of the lower jaw, the absence of canine teeth, and the peculiarly ridged surface of the molars.

The tail of the Kangaroo—thick, strong, and tapering—is over three feet in length and a foot in circumference at its base. It acts as a supplemental limb when the animal assumes an erect or sitting posture, with the hind legs forming an excellent tripod. It is also of use as a balance in leaping, and as a weapon it can deal a blow capable of breaking a man's leg. When feeding, or walking short distances on all fours, the Kangaroo is exceedingly clumsy; but when alarmed it travels at a great speed in a series of leaps, of as much as twenty feet, and clearing with ease obstacles nine and ten feet in height.

The woolly fur is usually brown in colour, lightening to grey, especially on the under side; the tail is tipped with black. The skin when tanned forms a soft and durable shoe leather.



TEETH OF THE GREAT KANGAROO.

No mammal in any of the orders previously described is produced at birth in such an undeveloped state as the young Kangaroo. Professor Owen, from close

observation in the Zoological Gardens, described the young marsupial as resembling more than anything else an earthworm in the colour and transparency of its integument. Yet though little more than an inch in length, it breathed slowly but strongly, while it adhered to one of the four nipples to which the mother applies her young with her mouth. The newly born little animal is too weak to obtain milk by sucking. This difficulty is met by the parent contracting a muscle of the mammary gland to inject the liquid into the mouth of her progeny until it gains sufficient strength to feed itself.

There is only one young one at a birth. Before it leaves the pouch it may be seen poking out its head to nibble the herbage among which the mother is moving. Even after it is able to make fair progression it will fly to the pouch when

danger threatens, and it is remarkable how adroitly an old doe will gather up her young one while she herself is in full flight.

Big males are called by the colonials 'Boomer,' 'Forester,' or 'Old Man.' A female, especially before she has borne young, is called a 'Flying Doe'; while a young one carried by the mother is known as 'Joey.'

A Kangaroo hunt is an exciting sport, in which the animal displays astonishing pace and staying power. British foxhounds would be useless in the chase, for which are engaged a special breed of greyhounds called Kangaroo dogs.

All Kangeroos are timid, and at the least token of danger seek safety in flight; but when brought to bay a full-grown male is no mean opponent. Woe betide the dog that comes within reach of the great claw, for its hunting days will end with one stroke of the knife-like weapon. If the 'Boomer' can reach water he will enter it up to his shoulders, and await the approach of a dog, which he will seize in his fore paws and hold under water until it is drowned. Even a man will come to grief badly if the desperate animal can take hold of him.

The female displays less powers of flight and less courage at close quarters. She always seeks cover, and by powerful leaps to the side endeavours to throw the dogs off the scent. When very hard pressed she will fling her young one into the bushes as she hurtles along. This action is often viewed as an effort at self-preservation—in sailor parlance 'lightening the ship.' Upon the other hand, it may be only evidence of the mother's affection for her offspring, merely a desire to give it an opportunity of escape, when for herself there remains no single loophole.

The Great Grey Kangaroo, like all its near relations, is entirely herbivorous. It is gregarious, and herds of from thirty to fifty made inroads on grass pastures that greatly displeased the early Australian sheep-farmers. Apart from this, the flesh of the Kangaroo is greatly esteemed; in fact, the animal was formerly to the aborigines what the bison was to the red man or the seal still is to the Eskimo. The

natives converted the skin into sacks in which to carry the little impedimenta with which the benighted savage troubles to load himself ; the bones served for rude needles, and the tendons, especially of the tail, provided string or thread. The great cutting nail of the hind foot made a very serviceable spear tip.

The flesh of all the herbivorous marsupials is uniformly good for food. Of the larger Kangaroos, the forequarters are usually the perquisite of the dogs that have run the quarry down ; but from the hindquarters may be cut some very fine steaks. Cooked in the same manner as venison collops, they are little inferior to the flesh of the deer. But the most highly prized part is the tail, which in the case of a 'Boomer' will weigh as much as twelve pounds. It makes a soup that causes the best oxtail to take a very decided second place.

The Great Grey Kangaroo is a plain and forest dweller, but other species are found even on the snowy summits of the Australian mountains. The Woolly, or Red Kangaroo (*Macropus rufus*), is slightly larger than the Great Grey. It has a naked face, and inhabits rocky districts, but in build and general habits it presents no points worthy of separate notice, a remark which applies equally to several other of the larger species.

The Tree Kangaroos, found in New Guinea and Northern Queensland, form a distinct and remarkable group (Plate XLIII. Fig. 1). In size they are only about one-third as large as the foregoing ; there is no great difference in the length of the fore and hind legs, and there is no markedly prominent toe. Though it was long doubted, the fact is established beyond all question that these animals climb trees. It may be that they adopted an arboreal habit in order to obtain better food than existed on the surface of the ground, for they possess no special modification of limbs to enable them to climb trees other than clumsily.

Kangaroos are easily domesticated. They thrive well in England, where the climate is more favourable than in some of their native regions. At Tring Park, Lord Rothschild's estate, troops of the graceful animals may

PLATE XLIII.



1. TREE KANGAROO. 2. RED-NECKED WALLABY.

(See page 437)

(Photo W. Saville-Kent, F.Z.S.)

(Photo W. S. Berridge, F.Z.S.)

PLATE XLIV.



1. SPOTTED CUSCUS.

(See page 439)

2. RAT KANGAROO.

(See page 438)

(Photos W. S. Berridge, F.Z.S.)

be seen, at least as happy as though they were in the bush of the great Southern Continent.

WALLABY.

Under the colonial and unscientific name of Wallaby are included numerous species of the smaller and brighter coloured Kangaroos. Any differences in their structure are either too trifling or too technical for discussion in a rather elementary and chatty account of animal life. Inhabiting the dense scrub, various species are styled Brush Kangaroos, the largest of which, the Red-necked Wallaby (*Macropus ruficollis*), Plate XLIII. Fig. 2, is about forty inches long in the body, with a tail of thirty inches. Their leaping powers are little less than those of the greater Kangaroos.

Of various other species classed as Small Wallabies, some of which are the size of a rabbit, the 'Padamelon' (*Macropus theditis*), with a body twenty-six inches long, is perhaps the commonest, especially in New South Wales and Victoria.

The Rock Wallabies inhabit the rugged and more arid regions. The largest of them, the Yellow-footed Rock Wallaby (*Petrogale xanthopus*), is the gaudiest of the Kangaroo tribe. The fur on the back is principally grey, with a very definite black streak running from the top of the head between the ears to the middle of the back. Above the eye is a yellow spot, and below it appears a white stripe with a similar one from the elbow to the hip. The chin and under parts are white. The ears and the lower portions of the limbs are yellow, and on the tail are alternate brown and yellow rings. The Short-eared Rock Wallaby (*Petrogale brachyotis*) is sufficiently described in its name.

The Hare Wallabies, in size and appearance and not a few of their habits, somewhat resemble the common hare, and, like that animal, their flesh is delicious. A 'Padamelon' of twelve or fourteen pounds in weight, cooked like a hare, is a dish to satisfy the most fastidious gourmand.

RAT-KANGAROO (*Hypsiprymnus rufescens*).

Plate XLIV. Fig. 2.

The Potoroo, of which there are several species, is generally known as the Rat-Kangaroo. The latter is not a particularly happy name, for, though the fore limbs are proportionately longer and the hind limbs less powerful, in form and habits the little animal is a perfect Kangaroo in miniature. The chief variations lie in the Potoroo's different dentition, its narrower fore feet, and sometimes its partially prehensile tail.

Even the largest Rat-Kangaroo seldom exceeds the size of a rabbit. Some of them are clothed with dense and often beautiful fur. The whole of the nine species are harmless and timid ; they are nocturnal, feeding on grass, leaves, and roots. The little Potoroo has only one young at a birth, and, like all marsupials, there is only one birth during the year. If a similar statement could be made concerning the common rat it would cease to be viewed as a dangerous and expensive pest.

Except by the Australian blacks, the Rat-Kangaroo is little used as food. White men are prejudiced against it by its popular name, although in reality the flesh of the Potoroo is not unlike that of rabbit.

FAMILY PHALANGITIDÆ (PHALANGERS).

The Phalanger family includes various animals of moderate size with notably common features, the chief of which, as the name implies, is the union of the second and third toes of the hind foot. All of them are thickly clothed with short, woolly hair, often beautiful in colour and rich in texture. The tail is usually long and more or less prehensile ; in many cases it is bushy, but sometimes hair appears only at the base, and it is scaly towards the extremity. The fore paws are strong and specially adapted for grasping and for life among the branches of trees, where most of the animals spend their lives. The Phalangers

are nocturnal, and while some are quite herbivorous, there are others with carnivorous inclinations.

SPOTTED CUSCUS (*Phalanger maculatus*).

Plate XLIV. Fig. 1.

Of five different species of Cuscus, usually about the size of the common cat, the Spotted Cuscus is the most noticeable, if only for the male's remarkably handsome coat. Upon a groundwork of yellowish white are irregular patches of reddish brown and black; the white under parts are often tinged with yellow or red, while the head and limbs are greyish red. Other species are mainly grey and black. The Grey Cuscus (*Phalanger orientalis*) of Amboyna, Timor, &c., was the first Australasian mammal known to Europeans, having been discovered and described as early as the opening years of the seventeenth century.

To return to the Spotted Cuscus. Its tail has the terminal portion completely naked; the feet are furnished with strong curved claws, and the hind ones, further, are fitted with fleshy pads, which assist stealthy descent upon birds and small animals. By night it is as active as by day it is dull and sleepy. 'They live in trees,' says Mr. Wallace, 'feeding upon the leaves, of which they devour large quantities. They move about slowly, and are difficult to kill, owing to the thickness of their fur and their tenacity of life. A heavy charge of shot will often lodge in the skin and do them no harm, and even breaking the spine or piercing the brain will not kill them for hours.' As the animals are slow in motion, when disturbed, as they lie coiled up in the trees in the day-time, they are easily caught by the natives for their flesh; and but for the rather sparse population the Cuscus would speedily be exterminated.

TRUE PHALANGERS.

The True Phalangers are usually called Opossums in Australia. They differ in various minor details from the

Cuscuses, but there is no mistaking the long tail, which is bushy to its very tip. The Vulpine Phalanger (*Trichosurus vulpecula*), as its specific name implies, is fox-like in its general appearance. The teeth are not specially characteristic, and differ considerably in the various genera. The animal can exist upon vegetable food, but it is fond of insects, small reptiles, and eggs. It captures birds very much in the same fashion as does the lemur, by creeping noiselessly upon its prey and seizing it while it is asleep. The Phalanger always commences its feast by crushing the head and devouring the brain. The flesh of the animal has a peculiar camphorated flavour, the result of the camphor-perfumed leaves upon which it feeds. Nevertheless it is a favourite food of the Australian black man, and the sight of an 'Opossum' will shake the aborigine out of his accustomed lethargy, and inspire him even to fell a tree rather than forgo his prize.

FLYING PHALANGER (*Petaurus taguanides*).

Coloured Plate XXXII. Fig. 5.

The most interesting members of the Phalanger family are the Flying Phalangers, of which the one figured is the most highly developed example. The distinguishing feature is a hairy membrane or fold of the skin which extends along the flanks, and which is capable of being used as a parachute to enable the animal to leap great distances, after the fashion of the Colugo and the Flying Squirrel. The membrane, which appears along both fore and hind legs, does not extend beyond the latter. Nor does it include the long bushy tail, the hair of which is arranged to render it useful as a support, as well as a rudder to guide the animal through the air. 'When chased or forced to flight, it ascends to the highest branch and performs the most enormous leaps, sweeping from tree to tree with wonderful address ; a slight ascent gives its body an impetus which, with the expansion of the membrane, enables it to pass to a considerable distance, always ascending a little at the extremity of the leap ; by this ascent the animal is prevented from receiving the

shock it would otherwise sustain.' It sweeps from tree to tree with a bewildering rapidity, but, nevertheless, its movements cannot be described as true flight, any more than those of the colugo, polatouche, or anomalure described in earlier chapters.

In the Great Flying Phalanger (*Petauroides volans*), an animal with a body twenty inches in length, the flying membrane is considerably reduced. The Pigmy Flying Phalanger (*Acrobates pygmæa*) is only three inches in length, with a tail longer than the body. Its fur is long and silky. Notwithstanding the smallness of the creature it has a perfectly developed pouch. The tail greatly resembles a feather in its perfect arrangement of the hair in two opposite fringes.

KOALA (*Phascolarctus cinereus*).

Plate XLVI. Fig. 1.

The Koala is a type differing so widely from the foregoing Phalangiers as to form in itself a separate sub-family. It is a podgy, tailless, woolly clothed animal with a short, thick-set head and round, tufted ears. It is often absurdly called the Australian Bear, with which animal it has little in common beyond a resemblance to the woolly toy monstrosity that is so popular in nurseries. Owing to the facility with which it can climb trees it is frequently called the 'Native Monkey,' in comparison with which it is in reality the veriest sluggard; and it altogether lacks the volatile temperament of the four-handed beast.

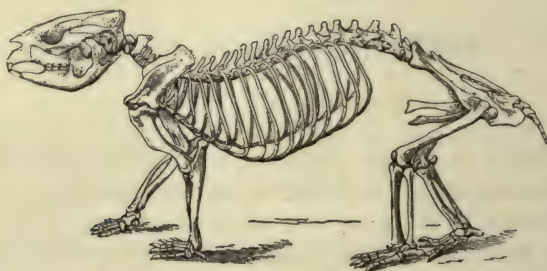
The Koala is one of the most sedentary animals imaginable. It will live in the same tree for days, or even weeks, if the supply of leaves and flowers upon which it feeds does not give out. The female has only one young one at a time, which is carried about on its mother's back until it is half her own size. Being perfectly harmless and positively droll in appearance, the Koala frequently becomes a household pet. Sometimes, however, it gives way to sudden gusts of rage, and yells shrilly in rather an alarming manner.

FAMILY PHASCOLOMYIDÆ (WOMBATS).

COMMON WOMBAT (*Phascolomys mitchelli*).

Coloured Plate XXXI. Fig. 4.

Of all the marsupials the Wombats, of which there are three species, are the most rodent-like. The colonists call them Bears and Badgers, and there is some excuse for the latter, as the animals excavate remarkably large earth burrows for dwelling-places. A description of the Common Wombat will serve for the whole family. It is clumsy in body, which is covered with coarse hair, brownish grey or even black and yellow, which thickens considerably towards



SKELETON OF THE WOMBAT.

the hindquarters. Its hide is particularly tough, and with its thick harsh fur makes most durable door-mats. The dentition of the animal is worthy of notice; throughout its life its teeth grow without interruption. In each jaw are a pair of powerful incisor teeth strongly suggestive of the Rodents. All the toes, except the great toe of the hind foot, are fitted with claws. The hind feet are partially webbed. Thanks to its heavy body and its short legs, the gait of the animal is only a rolling waddle.

The Wombat is nocturnal and feeds upon grass and other vegetable substances. It is distributed over nearly all Australia and Tasmania. Though with its incisor teeth it can bite severely, the animal is shy, and rarely offers resistance if captured during daylight. It is said to possess the power of sustaining life under water for quite a long time.

If in its travels it encounters water, it makes no attempt to swim across it, but walks along the bottom until it can emerge on the other side.

The flesh of the Wombat is said to be not unlike venison in taste, and as a full-grown animal will scale as much as a hundred and forty pounds, its capture means a welcome addition to the hunter's larder. Owing to the depth of the creature's burrow, even a hungry native views with disfavour the task of digging it out, and prefers to wait to catch it by some less laborious method.

FAMILY PERAMELIDÆ (BANDICOOTS).

BANDICOOT (*Perameles nasuta*).

Coloured Plate XXXII. Fig. 1.

The Bandicoots, little insectivorous Kangaroos, with their long slender snouts, though larger, are something similar to the Shrews in general appearance. About sixteen inches in length, exclusive of the tapering, cylindrical tail, their build is stout but clumsy. The hind feet are of the same type as in the Kangaroos. The fur in colour is grizzled yellowish brown, but in the Banded *Perameles* there are four or five pale bands vertically crossing the hindquarters. The Rabbit Bandicoot (*Peragale lagotis*) and the Pig-footed Bandicoot (*Chæropus castanotis*) are species whose names indicate their distinguishing features. The pouch opens towards the hinder part of the body. In movement, owing to the greater length of the hind legs, all Bandicoots make progression in hare and rabbit fashion. They are the commonest of the Australian marsupials, much to the regret of the colonists. Omnivorous in their diet, they eat roots, berries, and almost any vegetable substance, to which they add insects and worms. They do immense damage in the settled districts, ravaging cultivated fields and working havoc in granaries; and for this even a delicious meal of roasted Bandicoot the farmer does not consider sufficient atonement.

FAMILY DASYURIDÆ (DASYURES).

What the colonists call Native Cats are carnivorous marsupials of civet-like appearance. Though they are mild and inoffensive in aspect, in reality they are as bloodthirsty as the stoats and weasels of the Northern Hemisphere. About the size of an ordinary cat, the body is freely spotted with white upon a groundwork of brown or grey. There are five species, of which the Spotted Dasyure (*Dasyurus maculatus*), Plate XLV. Fig. 1, is well known in Australia and Tasmania. They are all arboreal in habit, coming out of the hollows in the gum-trees in search of birds and smaller marsupials. But the outlying colonials' hen-roosts often bear testimony to the fact that the Dasyures have a liking for prey that calls for little trouble in the hunting.

TASMANIAN DEVIL (*Dasyurus ursinus*).

Plate XLV. Fig. 2.

The Ursine Dasyure is popularly known as the 'Tasmanian Devil,' which appellation does not suggest that the animal possesses any very lovable characteristics. Its reputation, indeed, is blacker than its coat, which here and there shows redeeming patches of white. Except for its



TEETH OF THE DASYURE.

longer tail this ugly Dasyure generally resembles a bear, or what a bear might be if it grew no bigger than a badger. It is shortish, with a broad head, and its mouth is furnished with teeth distinctly carnivorous in character. It is strictly a

nocturnal animal, scarcely able to see in daylight, during which it coils itself up in a cave, other rocky lair, or a burrow of its own construction, from which at night it issues to prey upon any living creature that it can overpower. Mammals, reptiles, or even dead fish on the seashore are all welcome to this voracious feeder.

PLATE XLV.



1. SPOTTED DASYURE.

2. TASMANIAN DEVIL.

(Photos W. S. Berridge, F.Z.S.)

PLATE XLVI.



1. KOALA AND CUB.

(See page 441)

2. THYLACINE.

(Photo W. Saville-Kent, F.Z.S.)

(Photo L. Medland, F.Z.S.)

The Ursine Dasyure proved a positive scourge to the earlier Tasmanian sheep and poultry farmers ; and Government action was necessary to remove a menace to the prosperity of the colony. As late as thirty years ago in one winter over a hundred savage depredators were captured within the confines of one large farm. Nowadays the animal is found only in the less settled districts.

THYLACINE (*Thylacinus cynocephalus*).

Plate XLVI. Fig. 2.

The Thylacine, or Tasmanian Wolf, is the largest of the carnivorous marsupials. A casual observer would immediately classify it as a member of the canine family ; and, indeed, it bears a more general resemblance to the wolf than the Ursine Dasyure does to the bear. But the Tasmanian Wolf is undoubtedly a true marsupial, with a well developed pouch, although the marsupial bones are replaced by cartilages. The pouch opens backwards and not forwards, as in the Kangaroos.

Very dog-like, narrow-muzzled, and clean-limbed, the Thylacine attains a length of four or five feet, including the tail. Its coat is mainly greyish brown with a dozen or more transverse black bands across the back and loins, which gain for it the title Zebra-wolf.

Hunting by scent like a true dog, the Thylacine exhibits tremendous staying powers. For hours on end in a steady canter it will track down kangaroos, wallabies, and smaller marsupials, leaving its young to follow at their leisure to join in the feast that will probably await them. Nothing could have suited it better than for sheep to have been introduced into its native regions. The imported flocks speedily suffered to such an extent that the Tasmanian Government put a price upon the heads of the marauding tribe ; and this, in conjunction with the increasing settlement of the island, has led to the extermination of the Thylacine except in the more secluded mountainous regions.

PHASCOLOGALES (POUCHED WEASELS).

Only about the size of the common rat are the Phascologales, of which genus there are over a dozen weasel or rat-like species in Australia and New Guinea. They are arboreal and insectivorous, and climb trees in search of their insect prey. In all probability they have larger families at a birth than any other marsupial. The pouch is not the usually well-defined bag, but consists of mere loose folds of skin, in some cases with ten teats instead of four, as in the Kangaroos and Phalangiers. The best known is the brush-tailed Phascologale (*Phascologale penicillata*), a pretty little animal that will make its nest in barns and similar buildings, instead of in the hollows of trunks of trees or even amid the branches.

Smaller still are the Pouched Mice. One of the smallest species known is the Jerboa Pouched Mouse (*Antechinomys laniger*). Its hind limbs being abnormally long, it is enabled to make progression by leaps and bounds in the same fashion as the jerboa, or the head of the marsupials, the Kangaroo.

BANDED ANT-EATER (*Myrmecobius fasciatus*).

Coloured Plate XXXII. Fig. 2.

In some respects the Banded Ant-eater is one of the most remarkable of the marsupials. In Southern and Western Australia, to which it is limited, it is known as the 'Squirrel,' although it lives mainly on the ground. It is a true ant-eater, in the possession of a long extensile tongue. Paradoxically it is a marsupial without a pouch. It has not even the shallowest of skin folds. The young, sometimes to the number of eight, attach themselves to the nipples which lie hidden in the patch of extra long hair that clothes the abdomen of the female. But if the Banded Ant-eater lacks the great distinctive feature of the marsupials, it can boast of more teeth than any other animal in the whole order. It possesses fifty-two teeth, which number is only exceeded by the armadillos and some of the Cetacea.

FAMILY NOTORYCTIDÆ.

POUCHED MOLE (*Notoryctes typhlops*).

Coloured Plate XXXII. Fig. 3.

The Marsupial, or Pouched, Mole inhabits the sandy plains in the region of Lake Eyre. It is about five inches in length, or the same size as the European common mole. In colour it is light fawn, varying to golden yellow. The most remarkable feature of the animal is the abnormal size of the third and fourth toes of the fore limbs. They are scoop-like claws of great power, eminently serviceable to the animal in its sand-burrowing habits. It appears to spend its whole life in burrowing. Pressing its belly along the ground, it moves with a slow, sinuous motion for a few feet on the surface, and then, entering the sand obliquely, it burrows along at a depth of only two or three inches. Presently it will emerge to repeat the process. Probably no live specimens have been brought to Europe, for the animal will not eat food provided for it by its captors.

FAMILY DIDELPHIDÆ (OPOSSUMS).

OPOSSUM (*Didelphys dorsigerus*).

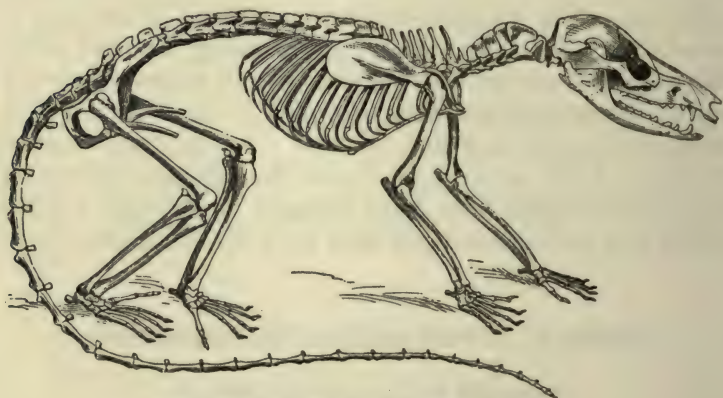
Coloured Plate XXXII. Fig. 4.

Without exception the marsupials already described are Australasian, but save the kangaroo and its allies the American Opossum (*Didelphys virginiana*) is perhaps the best known and certainly not the least interesting of the pouched animals.

The locality of the American Opossum is indicated in its specific name; it abounds in the warmer parts of North America, extending considerably north of Virginia. In form it is robust and in size about that of an ordinary cat. The colour of its fine woolly fur ranges from white to black, and includes numerous varieties of intermixture. The outstanding feature of the Opossum is its pre-eminently pre-

hensile tail, which is not quite so long as its body. There are five toes on each foot, possessing long and sharp claws, except in the case of the right foot, the inner toe of which is an opposable thumb without a claw. It is thus well fitted for life among the trees, around the branches of which it can twist its tail for additional security, or especially when its claws are partly occupied while devouring its prey.

The muzzle of the Opossum is long and pointed ; the mouth is wide and fitted with fifty teeth, with which to grind up its varied provender of leaves, tender shoots, and berries, insects, lizards, eggs, and birds. In the case of the last named the animal only sucks the blood and does not



SKELETON OF THE CRAB-EATING OPOSSUM.

eat the flesh. Its appetite is insatiable, and it is an annoyance to the fruit-grower, and a positive pest to the poultry farmer. While eating, it frequently uses all four feet as hands, twisting its tail round a branch and trusting alone to it for support.

There are usually a dozen or more young ones at a birth. They are blind and naked, and the little immature creatures cling to the mother's teats so firmly that they can only be moved by violence. In less than a week they leave the pouch, scampering back to their retreat at the least alarm. When thus sheltering her young the mother will suffer any torture rather than allow the pouch to be opened.

No other mammal, not even the fox, can surpass the

Opossum in pertinacity and cunning. Caught red-handed in one of its marauding excursions, or captured under any other circumstances, the slightest blow causes it immediately to feign death, even to the extent of a protruding tongue and film-covered eyes. It may be battered almost beyond recognition and will lie where it has been ignominiously flung without so much as the flicker of an eyelid. The moment, however, that its captor takes attention from it, the presumably dead animal regains its feet and effects its escape. 'Possuming' is a slang term that has thus come into use to denote the acme of human artfulness and deceit.

Merian's Opossum (*Didelphys dorsigerus*) is a wonderfully pretty species of Opossum which lives in Surinam, and is named in compliment to Madame Merian, who described and figured it in the year 1719. It is scarcely larger than a good-sized mouse, the body measuring only six inches from the nose to the root of the tail. It has scarcely a vestige of pouch, and so, robbed of this advantage, it carries its young on its back, curling its tail over, so as to allow the little ones to twist their tails around it. With her progeny thus secured from falling, and herself quite uninconvenienced, the mother, a combination of perambulator and feeding-bottle, can pursue her way in comfort. Even some of the larger Opossums adopt this method of carrying their young.

The Crab-eating Opossum (*Didelphys cancrivorus*), Plate XLVII. Fig. 2, although it finds most of its food on the ground, and even on the shore, is essentially an arboreal animal, the long prehensile tail being of great service to it among the branches. On the ground it is slow and clumsy, as is not infrequently the case with arboreal animals. As suggested by its name, the creature feeds upon the smaller crustacea as well as on the birds, small mammals, insects, &c., which form the usual food of an Opossum.

The Yapock, or Water Opossum (*Chironectes yapock*), of Guiana, is the marsupial representative of the beaver and other aquatic rodents. The hind feet are webbed, and the fore feet are remarkable for appearing to have six toes. This, however, is not the case, the apparent toe being in

reality a development of one of the wrist bones, which is much elongated, so as to support the web. This is but another illustration of the oft-repeated axiom that there is no waste in nature. In point of colour the Yapock is the most striking of all the Opossums, the hue of the fur being grey, crossed by four bands of deep black, and having a band of the same colour running along the spine, and spreading into a large patch on the top of the head. It is an active swimmer, chasing and catching fish in their own element. In consequence of its powers in the water, it often goes by the name of Otter, and even Buffon failed to detect its marsupial nature, describing it as the Little Otter of Guiana.

PLATE XLVII.



1. ECHIDNA.

(See page 453)

2. CRAB-EATING OPOSSUM.

(See page 449)

(Photos W. S. Berridge, F.Z.S.)



1. HEAD OF THE ECHIDNA. 2. DUCKBILL.

(See page 454)

Chapter XVI

ORDER XI.—MONOTREMATA

**General description of the Monotremata—Echidna—
Duckbill.**

CHAPTER XVI

Order XI.—Monotremata

WHETHER the few remaining mammals should be classed with the marsupials, or should form a separate order, was long a disputed point. In the marsupials the young are brought into the world while they are in an abnormally early and helpless stage. But there are mammals on a still lower rung of the evolutionary ladder, whose young are brought into the world in the shape of eggs—in one case deposited in an underground burrow, and in the other carried about in the pouch of the parent until the young are hatched. From that time their existence is continued exactly as in the case of the young marsupials.

The Monotremes, of which there are only two distinct family types, in the one aspect of egg-laying lean towards the reptiles, but in other respects are true mammals. They may be viewed as composites, links between the Mammalia and Reptilia. In any case their peculiar position merits the placing of them in an order of their own.

ECHIDNA (*Echidna aculeata*).

Plate XLVII. Fig. 1.

The Echidna, or Porcupine Ant-eater, a native of Australia, is quite an extraordinary creature. About a foot in length, it is much like a hedgehog, except that its spines are larger and stronger and are set in a coat of silky, chestnut-coloured hair. Its head is small, with a slender and very elongated muzzle. The mouth is small and toothless, but the tongue

and palate are furnished with rows of small spines. The tongue, in addition, is extensile and serves the same purpose as that of the Ant-eater (Plate XLVIII. Fig. 1).

The legs of the Echidna are short and the feet are fitted with enormous claws, the hind ones being directed backwards and outwards, thus forming excellent shovels for the removal of soil when engaged in burrowing operations.

In proportion to its size the strength of the Echidna is remarkable. It burrows with a rapidity equal at least to that of the mole, and if it cannot disappear entirely, in an almost incredibly short time it is buried sufficiently to present only its spiny back to an enemy. It cannot roll itself into a ball so successfully as the hedgehog.



MOUTH (A) AND NOSE-SNOUT (B) OF THE ECHIDNA.

With its claws it makes short work of ant hills, in which it confines its attention chiefly to the white larvæ and pupal phases of the insects. There is reason to believe that the animal varies its diet with grasses and herbs. In captivity it

evinces a liking for bread and milk and chopped-up meat.

The Echidna usually lays only one egg at a time; it is not larger than that of a sparrow; it is white and leathery, and is carried about in a skin fold until it is hatched.

The Tasmanian and New Guinea species call for no mention beyond the record of their existence.

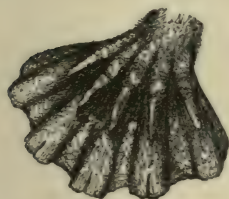
DUCKBILL (*Ornithorhynchus anatinus*).

Plate XLVIII. Fig. 2.

The Platypus, Duckbill, or Water Mole, is appropriately named in all three of its titles. The generic name means a snouted bird. When a stuffed specimen of the animal was

first brought to England it was viewed as a fraud, the work of a jocular taxidermist, whose humour has been known to produce an excellent mermaid out of the skin of a monkey and the tail of a salmon.

Reference to the illustration will render any minute description unnecessary. The body, ovate and depressed, and without any real neck, is clothed with short, dense fur, not unlike that of the otter in its colour and texture. The tail is short and flattened, and reminds one of that of the beaver, except that it is not naked and scaly, nor is it used for any other purpose than that of a helm. The webbing of the fore feet extends beyond the extremity of the claws. The Duckbill is as lithe of body as a cat. The



FORE FOOT OF THE
DUCKBILL.

skin, too, is so loose that when one is shot its bones will be broken, though none of the shots penetrate the skin.

The so-called beak is a prolongation of the bones of the face, but the result not only resembles the bill of a duck, but it performs a similar office in grubbing in mud in search of food. To protect the eyes it is fitted with a shield-like structure at the base. The animal possesses no true teeth, only flat, horny plates, which are quite sufficient to grind up the molluscs, worms, and insects which are extracted from the muddy beds. As it catches its food it stows it away in its capacious cheek-pouches.



UNDERVIEW OF BILL
OF THE DUCKBILL.

The Platypus is shy and retiring and strictly nocturnal in habit. Its burrow, thirty to fifty feet in length, always contains two entrances—one under water and the other usually in a thicket at some distance from the water's edge. The difficulties of watching such an animal are very great, and for many years it was a puzzle to naturalists. It was not until 1884 that it was proved to lay eggs, two of which are

deposited in a loose nest of weeds and roots at a secure point in the burrow. The covering of the egg is flexible, as in the case of many reptiles. The female's pouch is simply a fold in the skin, and that is only present during the breeding season; there are no teats, but the mammary gland swells into small projections, which can be seized by the pulpy lips of the young. The young animals are very playful, and in captivity are as droll and interesting as puppies.



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